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## Editorial

Faith & Thought is a registered charity with the object of 'The advancement of the Christian Religion as revealed in holy scripture'. One of the ways we do this is by awarding academic grants to people engaged in Christian study relating to science and contemporary thought. The only string attached to successful applicants is that they provide a paper for us based on their studies and we are delighted to include Iain McGee's paper which we are pleased to have been able to support in this way. If you or anyone you know would be interested in applying for a grant, the details are on our website, or at the back of this print journal.

We also have details for our 2024 Symposium on 'Implications of A.I.' please help us publicise this event and come along if you are able,

Finally, Faith & Thought is seeking to develop our social media presence as we hope to attract new members and stimulate greater conversation. Look out for our 'Particles of Faith' posts on Facebook, Twitter and maybe other platforms in the future. Please 'like' and 'share' these offerings with your own networks of friends and colleagues. Thank-you!

Alan Kerry (Co-Editor)

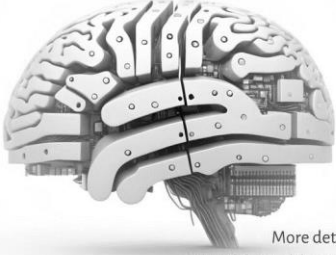
## 2024 Symposium and AGM

**Faith&Thought**  
A Christian forum exploring science, ideas and culture.

**Open Symposium 2024**

**Implications of A.I.**

**11th May 2024**  
Bloomsbury Central Baptist Church  
London WC2H 8EP



**Peter Robinson**  
Cambridge University

**Stephen N Williams**  
Queens University,  
Belfast

**Noreen Herzfeld**  
St. Johns University,  
Minnesota

More details at:  
[www.faithandthought.org](http://www.faithandthought.org)

### Agenda for Annual General Meeting to be held 11th May 2024

1. Chairman - the Rev. Dr R. H. Allaway.
2. The Minutes of the previous AGM.
3. Academic Grant Application
4. To approve the election or re-election of:
  - a. The President (Professor David Wilkinson),
  - b. Vice-Presidents (Prof. Malcolm A. Jeeves, Prof. Alan Millard, Prof. J. W. Montgomery),
  - c. Honorary Treasurer (Dr David Watkis),
  - d. Council (Rev. Bob Allaway, Rev. John Buxton, Dr Alan Kerry, Mrs Joanne Mead, Rev. Dr David Instone-Brewer and Dr David E. Watkis and Dr Todd Kantchev (ex officio)
5. The annual accounts, which are available on the website, will be presented by the acting treasurer Alan Kerry, for approval and to appoint auditors.
6. Plans for 2024-2025.

# Religious Truth in non-Christian Thought<sup>1</sup>

Iain McGee

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In the introduction to his Gospel, the Apostle John writes that the Eternal Word (the *Logos*) enlightens humankind.<sup>2</sup> Various opinions have been expressed concerning what this light entails, including: truth, reason, religious awareness, conscience, an awareness of God or even of Christ himself. While some theologians have made much of this light, and suggested that God can be known truly by it, the Apostle goes on to state that the light has not been comprehended (or overcome).<sup>3</sup> This being so, the light referred to in verse 4, and the human response to it, is eclipsed by John's focus on the *Logos* incarnate (verse 14) and Jesus' subsequent claim to be the light of the world.<sup>4</sup>

A number of theologians (including Augustine,<sup>5</sup> Calvin,<sup>6</sup> and more recently J. H. Bavinck<sup>7</sup>) made a connection between the light described

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<sup>1</sup> Some of the ideas present in this paper are from my PhD, to be published as 'Revelation in Christian Theologies of Religions: Voices from Across the Ages' (Eugene: Pickwick, 2024, *forthcoming*). I would like to thank *Faith and Thought* for awarding me an academic grant to help pursue these studies. The reader will note that I make a number of references to Justin Martyr, Augustine, Calvin and Jonathan Edwards in the pages that follow. The reason for a focus on their ideas is that my study focused on their thought about non-Christian religion.

<sup>2</sup> John 1:4 In him was life, and that life was the light of men. (All biblical references NIV)

<sup>3</sup> John 1:5 The light shines in the darkness, but the darkness has not understood it. Alternative textual reading: '...and the darkness has not overcome it.'

<sup>4</sup> John 8:12 When Jesus spoke again to the people, he said, "I am the light of the world. Whoever follows me will never walk in darkness, but will have the light of life."

<sup>5</sup> Homily 2.4 in Allan D. Fitzgerald, ed. *The Works of Saint Augustine: A Translation for the 21st Century, Part III – Homilies Volume 12: Homilies on the Gospel of John 1-40*, trans. by Edmund Hill, (Hyde Park, New York: New City Press, 2009).

<sup>6</sup> John Calvin, *Commentaries*, 22 volume set (Grand Rapids: Baker Book House, 1989). Also available at <https://www.ccel.org/ccel/calvin/commentaries.i.html>, originally printed for the Calvin Society, Edinburgh, Scotland, Comm. 1 Cor 1. 21.

<sup>7</sup> J. H. Bavinck, 'Religious Consciousness in History' in John Bolt, James D. Bratt and Paul J. Visser, eds. *The J. H. Bavinck Reader* (Grand Rapids: William B. Eerdmans, 2013), pp. 233-296, p. 247.

by John in the opening verses of the prologue to his Gospel and Paul's reference to the universal knowledge of God in Romans 1:18-21.<sup>8</sup> If this connection is correct, what is not comprehended (or overcome) in John's gospel (due to humankind's preference for darkness compared to light), is the same as suppressed knowledge of God in Paul's epistle.

The issue I would like to consider in this article is non-Christian knowledge of God. Using John's language, is it the case that the light humans possess from the *Logos* consists of any true knowledge of God? Using Paul's language, is the human suppression of the knowledge of God completely successful or does some knowledge remain? The reason I believe this issue is worth considering is because of the profound implications for inter-religious dialogue of various kinds. I will make the assumption that the goal of Evangelicals in such engagements is to point the religious Other to the light of the world (as John expresses it), or the one who brings righteousness (using one of Paul's terms for Christ).<sup>9</sup> What understanding of the religious Other does the Evangelical bring to the table? I provide two quite different answers to this question, before highlighting three statements which I believe are worth further consideration.

## **No truth**

One answer to the question posed above would be to argue that there is no truth that is not suppressed, no light remaining in the religious Other. I will briefly outline an epistemological and then a theological argument in support of such a position.

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<sup>8</sup> Romans 1: 18-21 The wrath of God is being revealed from heaven against all the godlessness and wickedness of people, who suppress the truth by their wickedness, since what may be known about God is plain to them, because God has made it plain to them. For since the creation of the world God's invisible qualities—his eternal power and divine nature—have been clearly seen, being understood from what has been made, so that people are without excuse. For although they knew God, they neither glorified him as God nor gave thanks to him, but their thinking became futile and their foolish hearts were darkened.

<sup>9</sup> Romans 3:22 This righteousness is given through faith in Jesus Christ to all who believe. There is no difference between Jew and Gentile

Firstly, epistemology. Those Christians who hold to a coherentist theory of truth, would reject the idea that there is any true knowledge of God correctly held in non-Christian thinking.<sup>10</sup> For those who espouse a coherentist theory of truth, any particular 'truth' is only true in so far as it relates correctly to other truths within a belief system. So, for example, the acknowledgment that there is a creator God in Islam, while in some ways correct (from a Christian viewpoint), may actually be considered not true by those holding to a coherentist epistemology, because that creator God is not triune. Reference to the larger belief system makes it clear that this apparent truth is not actually true. This is because for coherence theorists the larger belief system requires particular truths to be correctly related to one another within the overall system. That is, there needs to be meaningful *coherence* between different propositions within the holistic framework for an individual truth to be truly true. Unsatisfactory linkages between 'truths' within any particular system lead to its collapse, and as a consequence the individual 'truths' within it are ultimately called out as false.

While the coherentist argument is epistemological, a theological argument in support of the 'no true knowledge of God' position is to argue that there is a sharp antithesis between the knowledge of the Christian and non-Christian. In Jesus's words, if we are not with him, we are against him.<sup>11</sup> In Paul's words, believers are taken out of the kingdom of darkness and transferred into the Kingdom of the son whom God loves.<sup>12</sup> Theologically, the Christian is in Christ, the unbeliever lives in 'the realm of the flesh'.<sup>13</sup> The difference between the two is not one

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<sup>10</sup> Mark Farnham, 'Postfoundational Epistemology and Christian Uniqueness: Coherentism in the Theology of Stanley J. Grenz' (unpublished doctoral dissertation, Westminster Theological Seminary, 2015), p. 56 writes: 'the center of a coherentist theory of truth and justification [is]—a proposition is true and justified to the extent that it coheres with the other beliefs in the system.'

<sup>11</sup> Matt 12:30

<sup>12</sup> Col 1:13

<sup>13</sup> Romans 5:18; Romans 8:7 The mind governed by the flesh is hostile to God; it does not submit to God's law, nor can it do so. Those who are in the realm of the flesh cannot please God.

of degree, but of position. If one is not in Christ, and Christ is the Truth, the only alternative is to be in Adam, which is to be in sin and death.<sup>14</sup> Humankind is, accordingly, split into two distinct groups. If the source of spiritual life is Christ, one must be in him to know God, as Christ is the Truth.<sup>15</sup> Not to be in him means not to possess any knowledge of God.

The 'no true knowledge' position comes into its own, I suggest, in helping explain the seeming similarities between Christian and non-Christian thought. What on the surface seem to be so many points of agreement may, in reality, be ever so many differences, masked by a common vocabulary (e.g. justice, sin, guilt, salvation) once one gets into details. The idea that every seeming truth or knowledge held by the non-Christian is, in some ways, untrue unless correctly related to the source of Truth – Jesus Christ – and fully in accord with him, seems to have much going for it.

Above I have provided two rather different arguments to support the idea that there is no true knowledge of God in non-Christian thought. This is one way of considering what the beginning part of the Johannine prologue and Romans 1:18-32 teach: humankind wanders in darkness, and suppresses truth: accordingly, by nature we know nothing truly of God.

I now outline an alternative answer to the question under consideration.

### **Some truth**

The other viewpoint, which I summarise in what follows, allows for some real religious truth and knowledge of God to be present in non-Christian thought. As with the first position, I start with epistemology. For those

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<sup>14</sup> Romans 8: 1 and 2 Therefore, there is now no condemnation for those who are in Christ Jesus, because through Christ Jesus the law of the Spirit who gives life has set you free from the law of sin and death.

<sup>15</sup> John 14:6

who hold to a *correspondence* (as opposed to *coherence*)<sup>16</sup> theory of truth, so long as a particular truth does indeed correspond to reality (e.g. God is our creator), this is acknowledged as true regardless of the subjective state of the one who makes it.<sup>17</sup> Furthermore, it is not the case that a particular truth is judged to be correct on condition that it aligns correctly with other truths (or knowledges) within the larger belief system.<sup>18</sup> Correspondence with reality is what counts. If this is the case, then the Christian might say that there are some truths common to Islam and Christianity – or any other non-Christian system. The acknowledgement made to Jesus that he is ‘the Holy one of God’, though uttered by a demon,<sup>19</sup> may be considered a statement of true knowledge by correspondence theorists, given that the statement corresponds to reality.

Turning to theology, in the ‘no truth’ section, I mentioned a particular understanding of the antithesis, the viewpoint that the believer and the unbeliever stand in an antithetical position to one another. Those theologians who argue for some true knowledge of God being present in Christian thought might well support the idea of the antithesis, but place its locus or axis of operation between God and Satan, or sin and

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<sup>16</sup> Coherence theorists would typically require both correspondence and coherence in their thinking. I do not mean to imply that coherence theorists are uninterested in the need for correspondence. Rather, they wish to argue for more than this.

<sup>17</sup> Douglas Groothuis, an advocate of the correspondence theory, in *Truth Decay: Defending Christianity against the Challenges of Postmodernism* (Downers Grove: IVP, 2000), p. 109 states: ‘The theological statement “Jesus is Lord of the universe” is either true or false. Whether it is coolly uttered or it is proclaimed with great emotion, it has only one truth value: either true or false. It either honors reality or it does not. This is because truth is a quality of propositions and beliefs. It is not ratified by any subjective response or majority vote or cultural fashion.’

<sup>18</sup> Henry Stob, ‘Observations on the Concept of the Antithesis’, in *Perspectives on the Christian Reformed Church: Studies in its History, Theology, and Ecumenicity*, ed. by Peter de Clerk and Richrd R. De Ritter (Grand Rapids: Baker Book House, 1983), pp. 241-258 (p. 255) states: ‘Facts constitute the currency of the realm of knowledge, and they are both distinguishable from and separable from the interpretative context, in which, in any concrete instance they are inserted.’

<sup>19</sup> Mark 1:24 “What do you want with us, Jesus of Nazareth? Have you come to destroy us? I know who you are—the Holy One of God!”

grace. For humans, it is argued, there is always something of a mix. The believer, while in Christ, fights with indwelling sin, and the devil – and not always successfully.<sup>20</sup> The unbeliever, while not in Christ, may still be considered to be a recipient of God's (common) grace,<sup>21</sup> and, at times follow the law of nature<sup>22</sup> or in Jesus' words, though evil know how to do good.<sup>23</sup> The Bible's radically theologically-based ethics do not seem to allow such good actions to occur apart from some right knowledge of God.<sup>24</sup> A related argument 're-positioning' the locus of antithesis might be to focus on its eschatological reality, over against the current situation on earth where Christ's people may get things quite wrong, and adherents to other religions, due to an external work of the Holy Spirit,<sup>25</sup> get some things right, because of God's grace. Only on the last day will the antithesis be stark and final. If one adopts such a position, one need not exclude true knowledge of God from non-Christian thinking at the present time. Indeed, one may wish to stress the reality of this knowledge, not least because it contributes to arguments for the idea of meaningful human accountability before God.

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<sup>20</sup> Ephesians 4: 22 You were taught, with regard to your former way of life, to put off your old self, which is being corrupted by its deceitful desires...

<sup>21</sup> Acts 14: 17 Yet he has not left himself without testimony: He has shown kindness by giving you rain from heaven and crops in their seasons; he provides you with plenty of food and fills your hearts with joy.

<sup>22</sup> Romans 2: 13-14 For it is not those who hear the law who are righteous in God's sight, but it is those who obey the law who will be declared righteous. (Indeed, when Gentiles, who do not have the law, do by nature things required by the law, they are a law for themselves, even though they do not have the law...

<sup>23</sup> Matthew 7:11 If you, then, though you are evil, know how to give good gifts to your children, how much more will your Father in heaven give good gifts to those who ask him!

<sup>24</sup> 1 Thess 4:5 ... not in passionate lust like the pagans, who do not know God; Hendrik Kraemer, *The Christian Message in a Non-Christian World 2nd edn.* (London: Edinburgh House Press, 1947), p. 63 writes: 'The ethical is always in the Bible submerged in, derived from, and subordinated to, the religious, because the Bible is radically theocentric.'

<sup>25</sup> For the idea of the external work of the Spirit see Jonathan Edwards, 'Sermons and Discourses, 1743-1758' (1743), ed. by Wilson H. Kinnach, *WJE Online* 25, p. 611.

Another theological argument which might be forwarded in favour of the 'some truth' position is that as humans we are made in the image of God. While we are sinful, the argument goes, we cannot but, in some ways, reflect that image – even if it is inconsistent, or not rightly grounded in God. If all truth is God's truth,<sup>26</sup> one does not need to credit the unbeliever for holding to a particular truth, attributing this to some kind of human achievement. Rather, one can acknowledge that God, by his grace, can give insight and understanding to humans as humans (being made in His image). While this will not be considered salvific knowledge, it may be understood to be some true knowledge of God, nonetheless.

This is a brief summary of some of the points that might be argued by those who believe that there is some true knowledge of God among religious or non-religious people who do not acknowledge Jesus Christ as Lord and Saviour.

### **Reflection**

As you read the above, you may have found yourself drawn to one position rather than the other. Our experience and engagement with others (whether religious or not), might well influence this decision. We might have been in discussions where seeming similarities between a Christian and non-Christian viewpoint are challenged by deep-rooted different presuppositions which are seen to colour what the non-Christian says. If so, you may have been swayed by the 'no truth' position. Alternatively, it may be that you have been challenged by something in the life of a non-Christian – for example a stance on a moral issue – which has led you to believe God to be the source of this, and made you think a little more about what is known of God outside of saving knowledge of Christ.

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<sup>26</sup> This is a paraphrase of a comment made by Augustine in *On Christian Doctrine* 2:18 <https://www.newadvent.org/fathers/1202.htm>. A similar sentiment is also present in Calvin: *Comm.* Titus 1:12.

Rather than personal experience being the key factor in influencing which position to adopt, it may have been the case that some of the theological arguments mentioned above struck you as being more pertinent to the discussion than others. As noted, there are various biblical texts which might be appealed to in support of one position rather than the other. Here I will add one more example to each position, before mentioning one text appealed to by both positions. A correspondence advocate might reference Peter's assertion that Jesus is the Christ.<sup>27</sup> This statement was recognised by Jesus as being due to some kind of revelation from God (and therefore judged true), though it becomes clear, very quickly soon after, that this statement was not a correctly held truth in Peter's wider thinking – as the subsequent rebuke makes clear.<sup>28</sup> In this instance the true statement corresponded to fact, but, on further investigation, it was found not to have been correctly held within Peter's wider knowledge framework – yet still considered to be a genuine insight from God.<sup>29</sup> The coherence theory advocate might reference 1 Corinthians 2:14, which states that the person without the Spirit cannot understand what is from the Spirit of God.<sup>30</sup> Such a statement would seem to exclude any true spiritual knowledge.

One passage of Scripture that both groups have appealed to in support of their particular interpretation is Acts 17 – arguably one of the most important passages of scripture treating this subject. The 'some true knowledge' advocates might appeal to Paul's seeming endorsement of the ideas of the Stoic philosophers Epimenides<sup>31</sup> and Cleanthes and

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<sup>27</sup> Matthew 16:16 Simon Peter answered, "You are the Messiah, the Son of the living God."

<sup>28</sup> Matthew 16:23 Jesus turned and said to Peter, "Get behind me, Satan! You are a stumbling block to me; you do not have in mind the concerns of God, but merely human concerns."

<sup>29</sup> I acknowledge that this is a case with a believer – my focus is more on overall coherence.

<sup>30</sup> The person without the Spirit does not accept the things that come from the Spirit of God but considers them foolishness, and cannot understand them because they are discerned only through the Spirit.

<sup>31</sup> 'For in him we live and move and have our being' Acts 17:28

Aratus<sup>32</sup> and argue that Paul builds on these fragments of truth in his argumentation. The ‘no true knowledge of God’ advocates, on the other hand, might argue that Paul is actually showing that these statements show only total confusion, and stress that Paul indicates the wrongness of the philosophers’ ideas – culminating in his command to repent (Acts 17:30), rather than to tweak, or build upon bits of true knowledge which they possessed.

Does this leave us at something of an impasse? Are we to be forced to the conclusion that one can pick whichever view one wishes? Might we even choose to argue one position to be of value at one time, and the other at another? Having raised the issue, I hope it is clear that the discussion is an important one, but also rather complex. It is not my goal to try to answer it in this article – even if I could. However, to add something to the debate, I will make three statements below which I believe to be of real importance to it. I believe consideration of these points may well help us work through some of the issues.

### **Real knowledge doesn’t ‘stay true’ for long outside of abiding in Christ**

This point should be seen to balance parts of the ‘some truth’ argument. If the biblical witness does allow for some knowledge of God (and stay with me if you would disagree on this point!), it does not seem to allow it to stay true for the unbeliever: it is transient and passing. In what follows, I provide a brief overview of how this issue has been understood by a number of theologians who clearly gave some thought to this matter. Firstly, Calvin used the picture of lightning casting light around a traveller in the night to refer to the occasionally correct notions of God present in philosophers’ writings.<sup>33</sup> In amidst the darkness of

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<sup>32</sup> ‘We are his offspring’ Acts 17:28

<sup>33</sup> ‘They [the philosophers] are like a traveler passing through a field at night who in a momentary lightning flash sees far and wide, but the sight vanishes so swiftly that he is plunged again into the darkness of the night before he can take even a step let alone be directed on his way by its help,’ in John Calvin, *Institutes of the Christian Religion*, ed. by John T. McNeill (Louisville: Westminster John Knox Press, 2006), 2.2.18.

philosophy, he acknowledged the presence of fragments of truth – and believed God to be responsible for these. But ultimately, he argued that it did not make much difference – as the light was a very occasional intruder amidst lies and confusion. The light was real, but transient – not steady or actually guiding out of darkness (cf. Your word is a lamp for my feet, a light on my path (Psalm 119: 105)). Jonathan Edwards described a similar picture to that of Calvin, to make essentially the same point concerning a fragmentary and ultimately unsatisfactory human knowledge of God. He used the analogy of a man seeing trees in the night, describing the knowledge as ‘fainting, fading shadows.’<sup>34</sup> Like Calvin, the picture involves some light, but not much, and not enough to be helpful. Using an event from the life of Christ – the healing of the blind man at Bethsaida – might we consider the unbeliever’s knowledge of God to be analogical to the first step of healing recorded in Mark’s Gospel, Chapter 8 – where before his sight was *fully* restored the blind man saw men like walking trees?<sup>35</sup> Do those outside of Christ see God unclearly, but know he is there, and are aware of some of his attributes? I would suggest yes on the basis of Romans 1:18-21.

Focusing a little more on the transience of this shadowy knowledge, more specifically what becomes of it, Augustine, like Calvin and Edwards also seemed to argue that there was some kind of knowledge of God among the philosophers.<sup>36</sup> However, he believed this knowledge to result in pride. Subsequently, this pride led the philosophers into an

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<sup>34</sup> ‘A mind not spiritually enlightened beholds spiritual things faintly, like fainting, fading shadows that make no lively impression on his mind, like a man that beholds the trees and things abroad in the night: the ideas ben’t strong and lively, and [are] very faint; and therefore he has but a little notion of the beauty of the face of the earth. But when the light comes to shine upon them, then the ideas appear with strength and distinctness; and he has that sense of the beauty of the trees and fields given him in a moment, which he would not have obtained by going about amongst them in the dark in a long time.’ Jonathan Edwards [1722], The “Miscellanies”: (Entry Nos. a-z, aa-zz, 1-500) (*WJE Online* Vol. 13), Ed. Harry S. Stout, Misc. 408. SPIRITUAL KNOWLEDGE, p. 470.

<sup>35</sup> Mark 8: 22-25 v. 24 And he looked up and said, “I see men like trees, walking.”

<sup>36</sup> *Homily 2.4*

alliance with demons and a move to false religion.<sup>37</sup> While there was, in Augustine's thinking, a sight of the homeland in what the philosophers saw – a glimpse of the beatific vision – this glimpse never became steady clear sight.<sup>38</sup> Continuance in the knowledge attained was a key part of Augustine's Christian theology. He believed that this continuance was *impossible* without the mediation of Christ, and clinging to the cross of Christ – the only place where pride could be healed, and the beatific vision could become reality.<sup>39</sup> Augustine's position has good biblical support. The Apostle John argued that there is no *abiding* true knowledge of God outside of abiding in Christ.<sup>40</sup> The transient, hazy knowledge of God which humankind possesses (if one admits such to exist) is not light that dispels darkness, though it occasionally punctuates it. In sum, while one might wish to argue that sparks of light remain, it would seem wise not to make too much of this light. Furthermore, following Augustine, I suggest that it is unwise to believe that there are

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<sup>37</sup> *Saint Augustine Confessions* translated with an introduction and notes by Henry Chadwick (Oxford: Oxford University Press, 1998), 10.42.67.

<sup>38</sup> *Homily 2:4* 'They saw where they were to go, but, being ungrateful to the one who set what they saw before them, they wanted to take all the credit for the sight themselves; and, grown thus proud, they lost what they saw and turned away from there to idols and images and to the cult of demons, worshiping a creature and disdaining the creator.'

*Sermon Against the Pagans*, section 29: 'Now let the same apostle tell us how we may uncover their pride. And first let us just note that some of them too had attained to a knowledge of God, and yet he still wished them to be saved through Christ. You see, they had attained to a knowledge of God, but had not attained to salvation. I mean, it's one thing to attain to a knowledge of God, another to attain to salvation, when knowledge itself reaches its fullness, when the knower clings to the one known,' in *The Works of Saint Augustine: A Translation for the 21st Century Part III — Sermons Volume 11*, trans. and notes by Edmund Hill (New City Press, New York, 1997), p. 180. See also *On The Trinity* 4.15.20: '[...] some of them have been able to penetrate with the eye of the mind beyond the whole creature, and to touch, though it be in ever so small a part, the light of the unchangeable truth.'

<https://www.logoslibrary.org/augustine/trinity/0415.html>

<sup>39</sup> *Homily 2.4* 'They refused to hold on to the humility of Christ, the boat in which they would safely reach what they were able to see from a long way off; and they were disgusted by the cross of Christ. The sea has to be crossed, and you disdain the cross? O proud wisdom! You mock the crucified Christ; he is the one you have seen from a long way off—In the beginning was the Word, and the Word was with God...'. See also *Homily 2.2*.

<sup>40</sup> In 1 John 2: 18-25

permanently positive spiritual effects resulting from these transient experiences.

**Knowledge without orthopraxy<sup>41</sup> and orthopathy<sup>42</sup> is not 'true' orthodoxy<sup>43</sup>**

This second point should, I suggest, balance an important part of the coherence argument. Considered at face value, the coherence theory might be understood to hold that if true knowledge statements correspond to reality and are coherent within the larger system we have arrived at our end goal. But have we? A focus on true propositions (alone) in inter-religious dialogue is problematic for the reason that knowledge of and assent to propositions, is arguably, too narrow a focus.<sup>44</sup> From a Christian vantage point, the right disposition of the heart, and the biblical triunity of faith, knowledge and practice is clearly the more important focus.<sup>45</sup> A possible problem with both of the truth

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<sup>41</sup> By orthopraxy I mean Christian ethical practice.

<sup>42</sup> By orthopathy I mean right loves, or passions, relating to the heart.

<sup>43</sup> By orthodoxy I mean historically mainstream accepted Christian teaching.

<sup>44</sup> Titus 1:16 They claim to know God, but by their actions they deny him. They are detestable, disobedient and unfit for doing anything good. Matt 23:3 So you must be careful to do everything they tell you. But do not do what they do, for they do not practice what they preach.

<sup>45</sup> James 2:14 What good is it, my brothers and sisters, if someone claims to have faith but has no deeds? Can such faith save them? Matthew 15: 7-9 You hypocrites! Isaiah was right when he prophesied about you: ““These people honor me with their lips, but their hearts are far from me. They worship me in vain; their teachings are merely human rules. Col 1:10 ... so that you may live a life worthy of the Lord and please him in every way: bearing fruit in every good work, growing in the knowledge of God... 2 Thess 1:8 He will punish those who do not know God and do not obey the gospel of our Lord Jesus. Titus 1.1. Paul, a servant of God and an apostle of Jesus Christ to further the faith of God’s elect and their knowledge of the truth that leads to godliness ... 2 Peter 1:3 His divine power has given us everything we need for a godly life through our knowledge of him who called us by his own glory and goodness. 1 John 3:10 This is how we know who the children of God are and who the children of the devil are: Anyone who does not do what is right is not God’s child, nor is anyone who does not love their brother and sister. John 8:55 Though you do not know him, I know him. If I said I did not, I would be a liar like you, but I do know him and obey his word.

2 Peter 1:3 His divine power has given us everything we need for a godly life through our knowledge of him who called us by his own glory and goodness. 1 John 2:4

theories is that they do not consider the vitality of the knowledge.<sup>46</sup> While a demon may speak truth about God – a position that Augustine clearly held<sup>47</sup> – this ‘knowledge’ is obviously not the kind of knowledge that God wishes humans to have. While the Hebrew and Greek words *yada* and *oida* / *ginōskō* respectively have varied meanings, their semantic range can extend beyond mere cognition or assent to truth. The biblical view of knowledge of God is relational,<sup>48</sup> spiritual<sup>49</sup> and developmental.<sup>50</sup> Although Jonathan Edwards is well-known for his work on reason and epistemology, and often considered to have a very high view of reason, one of his arguments against reason’s sufficiency in religion is that the mind is not the right faculty to know God. While reason, correctly guided, can perceive truth, in Edwards’ thinking it cannot perceive excellence – i.e. God.<sup>51</sup> This, I believe, is a very helpful

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Whoever says, “I know him,” but does not do what he commands is a liar, and the truth is not in that person.

<sup>46</sup> John 17:3 – knowledge is eternal life

<sup>47</sup> In *Harmony of the Gospels 20.28 in A Select Library of the Nicene and Post Nicene Fathers of the Christian Church: Volume 6, Saint Augustin Sermon on the Mount Harmony of the Gospels Homilies on the Gospels*, ed. by Philip Schaff (Grand Rapids: Eerdmans, 1956), p. 88 Augustine writes ‘For I stop not to state that those things which we can read in their books repeat a testimony on behalf of our religion, that is, the Christian religion, which they might have heard from the holy angels and from our prophets themselves; just as the very devils were compelled to confess Christ when He was present in the flesh.’ Augustine, *On the Trinity*, 4, 17. 23, states: ‘But God acted thus [i.e. compelled truth to be spoken] through those who did not know, in order that the truth might resound in every place, as a help to the faithful, and as a witness against the godless.’

<sup>48</sup> Phil 3:10 I want to know Christ—yes, to know the power of his resurrection and participation in his sufferings, becoming like him in his death,

<sup>49</sup> 1 John 4:7 Dear friends, let us love one another, for love comes from God. Everyone who loves has been born of God and knows God.

<sup>50</sup> Ephesians 1:17 I keep asking that the God of our Lord Jesus Christ, the glorious Father, may give you the Spirit of wisdom and revelation, so that you may know him better. Ephesians 4:13 until we all reach unity in the faith and in the knowledge of the Son of God and become mature, attaining to the whole measure of the fullness of Christ.

<sup>51</sup> ‘Tis not ratiocination that gives men the perception of the beauty and amiableness of a countenance; though it may be many ways indirectly an advantage to it; yet ’tis no more reason that immediately perceives it, than it is reason that perceives the

point to remember in this discussion. Referring to Edwards' ideas again, there is a world of difference between knowing honey to be sweet and experiencing that sweetness.<sup>52</sup>

In making this point I do not mean to signal my approval of a shift of the spotlight to the heart, faith and practice away from knowledge in inter-religious dialogue. Unfortunately, it has too often been the case that such dialogue is dominated by relativism and pluralistic outlooks, and leaves little room for a clash of truth claims. But such clashes are the stuff of the Bible, whether between Moses and Pharaoh,<sup>53</sup> Elijah and the prophets of Baal,<sup>54</sup> Jesus and the pharisees<sup>55</sup> or Paul and his interlocutors in the marketplace in Athens,<sup>56</sup> and in the hall of Tyrannus.<sup>57</sup> The gospel as the proclamation of truth is front and centre in terms of knowing God.<sup>58</sup> If the truth sets free,<sup>59</sup> the Bible stresses that it must be known.

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sweetness of honey: it depends on the sense of the heart.' Jonathan Edwards [1730], *Sermons and Discourses, 1730-1733 (WJE Online, Vol. 17)*, ed. by Mark Valeri, p. 422. The following footnote is also relevant to this point.

<sup>52</sup> 'There is a distinction to be made between a mere notional understanding, wherein the mind only beholds things in the exercise of a speculative faculty; and the sense of the heart, wherein the mind don't only speculate and behold, but relishes and feels. That sort of knowledge, by which a man has a sensible perception of amiableness and loathsomeness, or of sweetness and nauseousness, is not just the same sort of knowledge with that, by which he knows what a triangle is, and what a square is. The one is mere speculative knowledge; the other sensible knowledge, in which more than the mere intellect is concerned; the heart is the proper subject of it, or the soul as a being that not only beholds, but has inclination, and is pleased or displeased. And yet there is the nature of instruction in it; as he that has perceived the sweet taste of honey, knows much more about it, than he who has only looked upon and felt of it,' Jonathan Edwards [1754], *Religious Affections (WJE Online, Vol. 2)*, ed. by Paul Ramsey, p. 272.

<sup>53</sup> Exodus 7-12

<sup>54</sup> 1 Kings 18

<sup>55</sup> Matt 23: 16-22.

<sup>56</sup> Acts 17:17

<sup>57</sup> Acts 19:9

<sup>58</sup> 1 Cor 1:21 For since in the wisdom of God the world through its wisdom did not know him, God was pleased through the foolishness of what was preached to save those who believe.

<sup>59</sup> John 8:32 Then you will know the truth, and the truth will set you free.

Having said this, Jesus did not *just* proclaim, and neither did Paul. Focusing on the latter for a few moments, Paul appealed to his practice of working and not requiring payment of his hearers (i.e., his ethical practice) in part to appeal to the integrity demonstrated in the delivery of his message.<sup>60</sup> He also appealed to the change that had occurred in his own heart, not just the message itself.<sup>61</sup> In any apologetic discussion knowledge and truth claims are important. At the same time, facts – and mental assent to them on the part of the hearer – are never going to be enough: God wants more than this. The tests of true knowledge, as John reminds us in his first epistle, involve obedience,<sup>62</sup> love for brothers,<sup>63</sup> and a turn away from the world.<sup>64</sup> A focus on various false knowledges, whether deficient in the object of the knowledge or lacking in the attendant life-changing consequences was a major concern for the Apostle Paul.<sup>65</sup> Justin Martyr boasted of the moral behaviour of Christians as proof of his claim for the truthfulness of the Gospel message he proclaimed to a sceptical Roman world.<sup>66</sup> It is to the Church's shame that today such appeals may be thrown back at us with scorn. Nevertheless, this living trinity of knowledge, faith and practice must not be split. When we see one without the other we need to be

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<sup>60</sup> 2 Cor 11:7-12

<sup>61</sup> Phil 3:7 But whatever were gains to me I now consider loss for the sake of Christ. What is more, I consider everything a loss because of the surpassing worth of knowing Christ Jesus my Lord, for whose sake I have lost all things. I consider them garbage, that I may gain Christ... 2 Tim 1:12 That is why I am suffering as I am. Yet this is no cause for shame, because I know whom I have believed, and am convinced that he is able to guard what I have entrusted to him until that day.

<sup>62</sup> 1 John 2:3

<sup>63</sup> 1 John 2:9

<sup>64</sup> 1 John 2:15-17

<sup>65</sup> Romans 10: 2 For I can testify about them that they are zealous for God, but their zeal is not based on knowledge. 1 Tim 6:20 Timothy, guard what has been entrusted to your care. Turn away from godless chatter and the opposing ideas of what is falsely called knowledge... 2 Timothy 3:7 always learning but never able to come to a knowledge of the truth. Titus 1:16 They claim to know God, but by their actions they deny him. They are detestable, disobedient and unfit for doing anything good.

<sup>66</sup> Concerning civil obedience see 1 Apology 17. For exemplary morality see: 1 Apology 12; 1 Apology 15; 1 Apology 16; 1 Apology 29 in *The Fathers of the Church, Vol 6, Writings of Saint Justin Martyr*, edited and translated by Thomas B. Falls (Washington D.C.: The Catholic University of America Press, 1948).

suspicious. The fruit of the Spirit, in Paul's thinking, is not ethical behaviour outside of a living faith and without a knowledge base.<sup>67</sup> That living, trinitarian, grounded and infused Christian life involving love, knowledge and faith is not easily brought to the debating room: perhaps this is why hospitality and the home may, at times, be better, or at the very least alternative, locations for Christian witness.

### **Jesus is the measure of truth and knowledge**

My third and final point is one which focuses not so much on the presence or absence of true knowledge, but rather re-orientates the question to ask, 'Who is truth?' and against whom (rather than against which theory of knowledge) truth claims should be measured. As with the previous point, I believe this to be particularly important for coherence theory advocates to consider, for whom truth or knowledge claims are considered holistically.

There has been quite considerable disagreement among theologians of religions concerning the reference point for non-Christian religions – should it be Christianity (which can be conceived in *some* ways as a system of beliefs and practices) or the person of Christ?<sup>68</sup> While I would not wish to drive a wedge between Christianity & the Church and Christ – who is the Church's Head and Life, I would tend to support the view that it is Christ who should be the measure of all religions and all truth

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<sup>67</sup> While the tree is known by its fruit, as Jesus noted (Lk 6: 43-45), our Lord also stated that the externals of the grave can stand in stark contrast to its internal state (Matt 23:27). Paul's reference to the 'fruit of the Spirit' in Galatians is connected to the redemptive work of Christ (1:4), saving faith in Christ (2:16), and the reception of the Spirit by hearing with faith (3:2). The idea that the fruit of this same Spirit is evident in those who do not have saving faith would, I suggest, make little sense to the Apostle Paul.

<sup>68</sup> See for example, Daniel Strange who argues for a reference to Christianity in *For their Rock is not as our Rock* (Nottingham: IVP / Apollos, 2014), p. 39, compared to Terrance Tiessen, who argues for Christ as the reference point for all religions, including Christianity in 'God's Work of Grace in the Context of the Religions', *Διδασκαλία*, (2007), 165-191 (p. 172).

claims.<sup>69</sup> Christianity, will, of necessity be much more aligned to this measure than other religions. It knows much more of Christ and acknowledges him as head. The Spirit (of Christ) is the one who has led the church into truth.<sup>70</sup> Christians confess Jesus as Lord and Saviour. In this sense there is a fundamental difference between Christianity and non-Christian religions and how they measure up to Christ's claims.<sup>71</sup>

So, what do I mean by the idea of Christ (rather than a particular instantiation of Christianity) being the measure of truth? I believe it is helpful to step back and consider some parts of the Old Testament, before proceeding to the New to help answer this question. It is clear from certain OT verses that Israel understood there to be wisdom outside its borders.<sup>72</sup> I make the assumption that this was not just due to borrowing truth from Israel – although I do not discount this possibility. Outside of Israel's borders, the presence of wisdom does not, however, guarantee that there is 'all wisdom' or that all there is is wisdom. I think it is fair to argue that this is not the kind of wisdom described in the book of Proverbs – the fear of Yahweh. And yet it is a kind of wisdom nonetheless.<sup>73</sup> In what follows I will seek to bring this idea into the discussion.

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<sup>69</sup> Rather than a particular historical and cultural instantiation of Christianity – whether that be 4<sup>th</sup> century Rome, 16<sup>th</sup> century Germany, or 21<sup>st</sup> century Brazil.

<sup>70</sup> John 15:26 “When the Advocate comes, whom I will send to you from the Father—the Spirit of truth who goes out from the Father—he will testify about me...”

<sup>71</sup> John Hick, the well-known advocate of pluralism, and editor of and also contributor to the *Myth of God Incarnate*, was quite self-consciously aware that if orthodox belief in the incarnation was right, then that was the end of arguments for pluralism: ‘If Jesus was literally God incarnate, and if it is by his death alone that men can be saved, and by their response to him alone that they can appropriate that salvation, then the only door-way to eternal life is Christian faith,’ in ‘Jesus and the World Religions,’ pp. 167-185, p.180 in *The Myth of God Incarnate*, ed. by John Hick (London: SCM Press Ltd, 1977). He immediately goes on to argue that such a view is not acceptable – indeed he terms it parochial – and argues for the need for a ‘global religious vision’ where God is seen to be working in all religions.

<sup>72</sup> See e.g. Prov 8. 15-16, 1 Kings 4. 30, Jer 49. 7 and Ezek 14.

<sup>73</sup> See David VanDrunen, ‘Wisdom and the Natural Moral Order: The Contribution of Proverbs to a Christian Theology of Natural Law’, *Journal of the Society of Christian Ethics*, 33:1 (2013), 153-168 for helpful discussion on this point.

Calvin differentiated two roles of the *Logos* in his comments on John 1:5 – that of redeemer and that of creator & sustainer. He argued that these second roles of the *Logos* are the focus of verses 4 and 5.<sup>74</sup> Humankind is totally dependent upon the creating and sustaining Eternal Word. While we do not participate rightly in God, we are nonetheless dependent upon Him. There is a strong tradition linking the *Logos* mentioned in the first few verses of John’s gospel with Hebrew wisdom.<sup>75</sup> If this is a valid connection, it would seem reasonable to argue that part of the life of the *Logos* which is the light of men is the wisdom which is both known in and witnessed in functioning societies around the world. This wisdom leads to societal cohesion, and basic adherence to norms of behaviour which make life liveable. In discussing the sustaining role of the *Logos*, Calvin spoke of conscience as a gift from the *Logos*. Who is it that prompts people when they do wrong? Calvin argued it was the Eternal *Logos* in his sustaining role. Who is it that confirms an action is correct? Jesus is termed the eternal law by Justin Martyr,<sup>76</sup> and Calvin equated the law and Christ.<sup>77</sup> Whether embedded within or found outside specifically religious structures, practices such as marriage, and concepts and ideals present in legislation upholding notions of justice and responsible citizenship all find their true source in Christ – and can be measured against him as wisdom incarnate. I am not suggesting that such practices or concepts are clear signposts to Christ, though I do believe that they can be pointed to in apologetic discussion.

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<sup>74</sup> Calvin, Comm. John 1:5

<sup>75</sup> As Cornelis Bennema notes, among the five possible backgrounds to the introduction to John’s gospel, one of them is ‘the Jewish wisdom traditions’. In his view this particular understanding ‘remains the most fertile environment to explain the claims made in the *Logos* hymn’, in Cornelis Bennema, ‘The Christology of the Johannine Prologue’, in *T&T Clark Handbook of Christology*, ed. by Daren Sumner and Chris Tilling (New York: Bloomsbury T&T Clark, 2024 forthcoming).

<sup>76</sup> Dialogue with Trypho 43 and 122

<sup>77</sup> See *Institutes* 2.8.7. I. John Hesselink, ‘Christ, the Law and the Christian’, in *Readings in Calvin’s Theology*, ed. by Donald McKim (Grand Rapids: Baker, 1984), pp. 179-191 (p. 189) comments: ‘For Calvin there is no inconsistency in referring sometimes to the law and other times to Christ as the norm or rule of godly living and as the expression of the will of God.’

It will be noted that in the immediately preceding paragraphs I have not been discussing knowledge of God, per se, but God as the source of sustaining wisdom, which we witness in society along with governing norms, etc. Am I saying that the wisdom present in our world (the light from the sustaining Logos) is limited to awareness of the second-table of the law? What about knowledge of God (first table law)? While it may well be the case that some second-table concepts have been accepted and enshrined in laws throughout the nations, while first table items have not, I suggest that the Christian would want to point out that the second-table items are from The Lord God of the first table, and necessarily reflect him. In this sense, knowledge of justice, while not knowledge of God, is, nonetheless, analogical knowledge related to an aspect of God's character, and can again, be considered to point to him in apologetical debate.

None of the significant traces of God's creative and sustaining power still present in the world make sense unless they cohere in Christ – and I use the word *cohere* quite deliberately, given earlier discussion of the coherence theory of truth. Christ as wisdom incarnate makes the wisdom that is present in the world meaningful, rather than leaving it as a shell, separated from its true meaning. Whether embedded in religion or outside it, the wisdom that does exist in the world is not sufficient in and of itself to fix our problems. This is where the second role of the *Logos* is so important – the redeeming role. Sustaining wisdom does not point to the solution to our failures in justice, mercy, brotherly love, etc. and does not explain how reconciliation with the God whose truth we might occasionally acknowledge can be achieved. What is more, false ideas are mixed up with wisdom, for example, ideas of re-incarnation, fate, or pantheism. Their presence results in a heavy layer of cloud surrounding the true wisdom that remains. Those outside of Christ, while occasionally seeming to make some progress in truth will only find a dead end outside of encountering Christ's redemption (rather than earthly

wisdom). Christ has been termed the crisis of all religions:<sup>78</sup> He is also, I suggest, the measure of all religions and religious truth claims. Measuring good practices and societal norms (whether within a religious system or outside it) against Christ is, I suggest, a helpful way out of the seeming impasse of the coherence / correspondence debate.

## **Conclusion**

In this paper I have outlined two possible answers to the question whether there is knowledge of God outside the Christian faith. While there are certain strengths with both the coherence and correspondence truth theories, I have suggested that it may be difficult to hold to one or the other position consistently, given some of the biblical material which seems to fall outside each theory. Following on from this, I have suggested that a possible way out of the impasse is to put the spotlight on three issues. The first of these is to argue that true knowledge cannot stay true outside of Christ for long: it dies when taken from its source (like cut flowers wither when taken from their roots). Secondly, I have argued that the kind of knowledge which a Christian is presenting to the unbeliever is 'vital', and hence not adequately catered for by either of the two truth theories. The living dynamism of the knowledge of God needs to be part of the debate, or perhaps more accurately (or ideally), needs to surround the debate. Finally, I have argued that Christ, being the ground of truth, should be the measure of religious knowledge and truth claims. Concerning this last point, I readily acknowledge that this will probably be rejected by other faith traditions. At the same time, I would argue that it is very important. Sparks of truth, I suggest, remain – whether within or outside religious tradition and practice. If this is so, then the one we point to – as the originator of those sparks – is the one of whom a vague awareness remains and in whom a deep coherence of those fragments is found. There is continuity of exposure to true revelation in human experience encountered through the Eternal Logos

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<sup>78</sup> Hendrik Kraemer, 'Continuity or Discontinuity' in *The Authority of the Faith*, ed. by G. Paton (London: International Missionary Council / Oxford University Press, 1939), pp. 1-21 (p. 3).

(as our creator), and much more fully, truly and meaningfully in our fallen state as Christ as our redeemer. The presentation of anything less than this message, I suggest, makes the Christian argument less than fully Christian. Christ is not so much the fulfilment of the truths present in religions as the fulfilment of the true voice that has occasionally been heard – whether within or outside a particular religion – and to whom we, by nature, struggle to listen.

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## **Almanac of Humanity (Part 1)**

### **Information and Consciousness - Todd Kantchev**

*Dr Todd Kantchev is Reviews Editor of Science and Christian Belief with degrees in computer science, medical physics and engineering.*

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**Abstract** The motivation behind this paper is to uncover biblical interpretations, needed to maintain consistency with the recent advances in science and technology and to convey them to non-academics, who may have insufficient knowledge in the disciplines concerned. Academic papers, solving a particular problem in detail, are usually not readily accessible to all people in authority. With that in view, I undertake a retrospective analysis of concepts like intelligence, consciousness and personhood, as studied by modern neuroscience, psychology, bioengineering and computational science and present it in the form of a survey of the current status in these areas. This is Part 1 of the project.

**Keywords:** artificial intelligence, AI, AGI, parallel computing, Turing machine, bioengineering, genome editing, gene modification, CRISPR, transhumanism, mind, consciousness, personhood, Christian ethics, philosophy of science and technology.

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### **Introduction**

In an ideal world, where evil has no place, technology is meant to apply science in enhancing, supporting, and protecting human life. However, the advancements in bioengineering and artificial intelligence (AI) in recent years, begin to impose teleological ends of their own, challenging human purpose in life. The most challenging ones come from the new understanding of the information processing, taking place in living forms as well as in computers.

Many people are perplexed by the rapid advancement of modern technology disrupting cohesion in society. They look for clarity and understanding of what is happening in the world, heavily dependent on science today. The changes are so fast that many futurists are talking about 'singularity' and 'paradigm shift' in the concepts, governing our society. Throughout these dynamic shifts, the only possible approach to employ the collective power of human thinking, is by surveying, analysing, filtering and integrating the results of the academic projects. We can achieve this with careful study of the Scripture and by surveying, critically analysing and integrating deducible conjunctures from the existing publications. Christian theologians have always been searching for new revelations, concerning the human condition. We do so in prayer by carefully studying the history of humanity and the Biblical texts<sup>1</sup>, which have always provided direction in a confused world over the centuries. All Bible citations are from ESV<sup>2</sup>.

If one is to reduce the really fundamental scientific discoveries of the last century, to those few which enabled all the rest, I would put in the list these three: the nuclear reaction (converting mass into energy), the structure of DNA, and the autonomous information processing taking place in living organisms and in the modern so-called *stored program* computer, invented at about the same time.

### **The Advent of the Information Era**

In 1822, Charles Babbage came up with an idea of constructing a mechanical device, able to compute automatically tabulating functions, needed for maritime navigation and engineering. The device was meant to be driven on algorithmic principles by a program, stored on punch cards from a Jacquard loom. It was ahead of its time and did not materialise. In 1896 Marconi demonstrated for the first time a wireless connection proving that information can be transmitted at a distance without a wire. However, the advent of electricity, radio and electronics

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<sup>1</sup> Barton, J., John Muddiman (Editors), The Oxford Bible Commentary, Oxford University Press 2001

<sup>2</sup> The Holy Bible. English Standard Version, Crossway Bibles, 2007

did not bring about the modern computer immediately because of the lack of knowledge about how to quantify information and the principles of computation. The physical basis of the computation is important because of the speed. If the calculation is too slow, the machine may not be able to produce results and engage with the outside world in a timely fashion. On the other hand, the principles of computation, regardless of the speed, are of primary importance for a general-purpose computing device, because if they are wrong, the machine would not be able to compute the task at all, never mind the speed.

In 1936 the British mathematician Alan Turing proposed a machine<sup>3</sup>, which became an archetype of the modern computer. His device was not intended to be physically built but used as an abstract model, defining the principles of general-purpose computation. Turing proved that his machine could solve all problems that could be expressed as  $\lambda$ -calculus, a mathematical model proposed by Alonzo Church six years earlier covering vast areas of numerical algorithms, virtually all known information processing areas. Yet, unlike the  $\lambda$ -calculus, Turing's model of computation was indeed a machine - very simple and powerful. It consisted of a simple device operating a tape. The device needed to have a limited number of states (finite-state machine), to operate its tape, but it needed to have an unlimited supply of it. The whole power of it was actually hidden in what was initially written on the tape; that was, in effect, its program. The key moment was the introduction of the concept of hardware and software, although these terms were not articulated in the literature until later. Separating hardware from software was a crucial moment in the invention of a general-purpose computer. The Turing machine defined the fundamental principles of computing in physical terms and opened a possibility for the engineers to build architectures for realistic high-speed machines, guaranteed to solve a large class of problems. Any machine to be built could be assessed in features against this model and if it could prove to be able to emulate it, in other words

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<sup>3</sup> Turing, A. M., On Computable Numbers, with an Application to the Entscheidungsproblem, Proceedings of the London Mathematical Society, Wiley, 1937, 230-265

to compute anything it could, it was said to be 'Turing-complete' or, loosely speaking, 'universal'.

Engineers learned how to quantify the information, when Claude Shannon published his theory of communication in 1948<sup>4</sup>. He proposed to measure the quantity of information by the uncertainty it removed on the receiving side of the channel and linked this idea to the concept of entropy, earlier devised in thermodynamics. He also suggested Boolean algebra could be used to design logical circuits that process numerical information.

The first *stored program* universal electronic computer, SSEM, which proved the concept<sup>5</sup>, was built in 1948 by F. C. Williams, T. Kilburn and G. Tootil in the University of Manchester, UK. In 1951 John von Neumann's team at the Institute for Advanced Studies (IAS) in the US, used Williams' tubes to build the first modern electronic computer<sup>6</sup> used in practice. Von Neumann, being the top applied mathematician and physicist of the day, was familiar with Turing's work and the SSEM project in Manchester. He had analysed the current status of computing from his point of view<sup>7</sup>. Key components of the design made by his engineers were the 6J6 twin triode vacuum tube as a switching element and an WWII reengineered radar oscilloscope tube (Williams-Kilburn tube) as a random-access memory. This primeval device, with an arithmetic unit of 40 bits and just 5 kilobytes of random accessed memory, was in fact a fundamental breakthrough of humanity in its conquest for a fast autonomous information processing tool. On this first stored program computer the mathematicians no longer needed to go to the engineers to program their tasks via cables and switches like on ENIAC, but used a restricted set of instructions to tell the machine what to do by encoding their algorithms just like the data to be processed. The power of the electronic universal computer went beyond fast calculations of analytical

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<sup>4</sup> Shannon, C. E., A Mathematical Theory of Communication, Bell System Technical Journal, Vol. 27, 1948

<sup>5</sup> [https://en.wikipedia.org/wiki/Manchester\\_Baby](https://en.wikipedia.org/wiki/Manchester_Baby)

<sup>6</sup> Dyson, George. Turing's Cathedral (2012), pp.130-153

<sup>7</sup> Neumann, J.V, First Draft of a Report on the EDVAC. Univ. of Pensilvania, 1945

formulas. With numerical algorithms the scientists realised they could model real-world objects and processes with accuracy and precision. They could simulate, test, and experiment without the need to actually build anything physically and there were vast areas of human activity which could be made more efficient to improve life. They were witnessing the beginning of the information era.

Alongside digital computing a significant advancement had been made in analogue electronic computing, which is based on gradual change of real-world values, represented by physical entities like mechanical distance, voltage, and/or electric current. However analogue computers were quickly overtaken by digital technology, based on switching of states, as being more reliable and precise.

The race for super powerful computers during the Cold War stimulated an avalanche of research projects for parallel algorithms and experimental machines able to execute them on multiple processors in parallel. One may think that parallel supercomputers mimic the human nerve system. However, general purpose computers do not embody the structural properties of the human anatomy and physiology, though the parallel algorithms in their aggregated processors may simulate the biochemical functions of the body to a very fine-grain level.

Every human activity today requires some form of information processing. The architecture of the smart phones, which we carry in our pockets, is not much different from that of von Neumann computer, but it is implemented with modern technology, which enables them to be millions of times smaller, more powerful, and affordable. They became like useful extensions to our brains and whether we like it or not we are now very dependent on them. Since WWII the total power for information processing and communication of a country has become an essential strategic component to its security. A specialised (not universal) computing device, for example, was used in England during WWII to decode the top-level communications of the Nazis. This saved many human lives by enabling crucial strategic decisions to be taken about combat operations and in effect bringing the war to an end. The

hydrogen bomb was designed and manufactured, with help from the von Neumann computer in the American nuclear labs, as a deterrent to further hostilities on a global scale.

How could inanimate objects like computers possess intelligence? Generally, any switching of states in matter can record information or can be considered a computation, but there is a controversy in overemphasising that. During the industrial revolution there was a wave of thinking that human beings were like mechanical machines. Similar views are still present today in the physicalist conjectures, but in the information era computationalism took over. There is a wave of thinking that not only the human mind, but everything in the universe is based on calculations. This is influenced by the latest theories of physics which come to realise that space and time are composed of discrete quanta, which can be considered fragments of information<sup>8</sup>. Atomic structures, like magnetic domains, are used to store discrete information on computers. DNA is an atomic structure at a molecular level that stores an enormous amount of information in the human body. But now even smaller structures in ordinary matter deep down at subatomic level may soon be used to represent and store information. Quantum computers are beginning to materialise<sup>9</sup>. Some even suggest that because everything in the universe has a physical law of behaviour then the whole universe is perhaps conscious, a giant computer implementing its laws. Such controversial views are expressed in modern pantheism (*The Phenomenon of Man*, P. Teilhard, 1955) the metaphysical conjectures of some futurists (R. Kurzweil, *The Spirituality is Near*, 2005 and Y. Harari, *Sapiens*, 2015) as well as in panpsychism<sup>10,11</sup>. By implying matter is primary and evolves into spirit they are materialistic in essence and therefore in conflict with the basic tenet of Christianity, expressed in the

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<sup>8</sup> Rovelli, C. Reality is not what it seems: The journey to quantum gravity, Reverhead Books, 2017

<sup>9</sup> <https://www.ibm.com/quantum>

<sup>10</sup> McGilchrist, I., *The Master and His Emissary*, 2009

<sup>11</sup> Goff, P., *Galileo's error*, Rider, 2019

Bible, which reveals a transcendent uncreated God creator of all things - material and spiritual.

Lots of arguments concern whether the machine's intelligence is the same as the human's. In the so called 'age of reasoning' people considered thinking as something that exclusively identified the human being, something sacred and inseparable from the soul. It was elusive of strict mathematical definition and still is. Rene Descartes in the 17th century defined it as a key activity, identifying humans: "I think, therefore I am". He established for centuries the philosophical idea of dualism, postulating that thinking and consciousness are activities of the mind, hence non material and yet firmly linked to it. John Locke, in *Essay concerning human understanding* (1690), said "...sense, perception, knowledge must be a property eternally inseparable from matter...". These ideas, while partially accepted in Christianity, do not acknowledge that intelligence, while being an attribute of consciousness, is not equated to it.

In 1950 Turing argued against objections that machines can think and proposed an 'imitation game' later called the Turing Test<sup>12</sup>. His argument arose from the proposition that if humans can think then we can make a test by placing a machine and a human in two separate rooms and then set another human to interrogate them in natural language conversation remotely. If the machine cannot think, or at least not in the same way as humans do, then it would become apparent. From 1991, after the first chatbots appeared, till 2003 this test had been performed periodically in reality by the Loebner Prize<sup>13</sup> but the motivation of the organisers was mainly to stimulate research in AI, not to measure intelligence. It increased the interest in creating software applications, which simulate intelligent chat and were later called

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<sup>12</sup> Turing, A. M., Computing Machinery and Intelligence, *Mind*, 1950, 59; 433-460  
(Find in <https://turingarchive.kings.cam.ac.uk/>)

<sup>13</sup> [https://en.wikipedia.org/wiki/Loebner\\_Prize](https://en.wikipedia.org/wiki/Loebner_Prize)

*chatbots*. For example, ELIZA<sup>14</sup> created in 1960-ies became very popular and managed to fool many that she was a human. A variation of the program even managed to pass the Turing test on several occasions. Chatbots stimulated the creation of natural language interface for practical applications<sup>15</sup> in the area of call management, online office administration and shopping, assistance in banking, voice control for TV, Hi-Fi and other home appliances, car satellite navigation and many others. They are being integrated now into many advanced medical products for health and social care.

Few people today would try to defend a position that machines cannot think after the computer Deep Blue beat the world chess champion Garry Kasparov in 1997<sup>16</sup>. But the Turing Test has never been proposed as a measure of intelligence like the IQ (intelligence quotient) test<sup>17</sup>. It was offered as a proof of the machine's ability to think and behave like a human. However, it is not clear what the performance criteria should have been in the first place: the amount of information and knowledge possessed, or the ability to infer or deduce knowledge from it, or the way they behave and react to different situations in life, according to that knowledge. It is obvious that there are many computationally intensive problems which humans cannot solve in practice and sometimes humans behave unintelligently. On the other hand, no algorithm can yet beat a human in complex, typically human, life situations involving human instincts, emotions and intuition. Intelligence is not the only ability identifying man. Also thinking is a skill which can be learned and amplified or diminished depending on the conditions. In that respect machines and humans are different, as are two individual humans which think and behave differently; their intelligence is differently expressed. This may even apply to biological traits of different

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<sup>14</sup> Weizenbaum J., ELIZA--A Computer Program for the Study of Natural Language Communication Between Man and Machine, Communications of the ACM (January 1966

<sup>15</sup> <https://www.developer.amazon.com/en-US/alexa>

<sup>16</sup> [https://en.wikipedia.org/wiki/Deep\\_Blue\\_versus\\_Garry\\_Kasparov](https://en.wikipedia.org/wiki/Deep_Blue_versus_Garry_Kasparov) (visited 2022)

<sup>17</sup> Stern, W., The Psychological Methods of Testing Intelligence. Educational psychology monographs. Vol. 13, 1914

social groups, cultures and nations in addition to their societal bias (culture), passed generationally. Besides cognitive, there are emotional and social aspects of intelligence as well, which are difficult to quantify. Traditional IQ tests cannot provide adequate measures for these. The validity of IQ tests today is arguable and theorists acknowledge the fact that human intelligence needs a broader understanding which includes other factors contributing to overall human success and flourishing in life.

The argument shifted from intelligence to consciousness when the philosopher John Searle joined the debate in 1980<sup>18</sup>. Searle, who is a behavioural naturalist argued that computers cannot have mind or 'understanding', or consciousness, supporting his argument with his 'Chinese Room' thought experiment.

When we talk about artificial intelligence, we mean computers and robots (human like machines) designed and built to satisfy a particular human need or to fulfil a specific purpose of our own. Even though they can be designed and assembled by other machines the origin of a particular AI can always be traced back to humans. Today's computers are built on silicon substrate, but with the advent of robotics and bionics scientists are turning to other substrates, including bio-molecular ones.

Today the ability of machines to analyse, perform and learn intellectual tasks, which human beings can, is a fact. The kind of AI which solves one problem or a narrow area of tasks in the capacity of a tool directed by humans or serving them, is now called 'weak AI' or 'narrow AI'. However, creating machines which will have general cognitive abilities and be able to replace humans in any task is a radically different idea that could affect the human race dramatically for good or bad. It alarmed sociologists, ethicists and politicians in the world when they realised the future of humanity may truly involve serious problems like a new 'racial' conflict, this time between super intelligent machines and biological

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<sup>18</sup> Searle, J., *Minds, Brains and Programs*, Behavioral and Brain Sciences, 1980

human beings. Yet, that is the primary goal of the so called Artificial General Intelligence (AGI) movement<sup>19,20,21</sup>.

Little by little we already delegate our everyday decisions to AI, thus letting it rule different areas of our lives for good or bad. The bad side certainly may come when our responsibility and authority in life becomes completely dependent on feelings and consumerism, manipulated by algorithms made in institutions and businesses, which are purely driven by profit or pursuit of power.

### **Life and Intelligence**

At the time of writing there is no consensus on the definition of life, neither among scientists nor among philosophers. A working definition in science implies life is a 'quality' of the biological (organic) matter, which employs certain type of processes like: homeostasis, metabolism, reproduction, response to stimuli and others. Non-living matter is distinguished from living matter by the fact that it does not have those processes. The concept of so-called *self-organisation* is emerging later as typical for life, but some researchers think it does not allow the differentiation of life from non-life either, because the boundary between living and non-living matter in that respect is blurred. For example, the spontaneous formation of order from disorder when enough free energy is available, can lead to the formation of crystals, but they are not considered living systems just because of that property. Yet in a way they are self-organising (self-assembled) systems.

Life and intelligence are intertwined concepts since a living entity is provided with the power to persevere and continue to exist by actively using some form of purposeful control or intentionality. The human body and all terrestrial life forms are built from the same basic components as stones and minerals, namely atoms. However, we call the former 'organic' matter and the latter 'inorganic'. Arguably, on a

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<sup>19</sup> <https://www.openai.com/>

<sup>20</sup> <https://www.deepmind.com/>

<sup>21</sup> <https://www.fhi.ox.ac.uk/>

molecular level it only is about size; organic molecules are much larger than inorganic. Long molecules exist because of the property of carbon atoms to bind to each other and make chains. Those chains form a backbone to which other essential elements like hydrogen, oxygen, nitrogen, phosphorus, sulphur and calcium attach to make more complex structures: carbohydrates, proteins and fats - the building material of life on Earth. The longer they are the more strangely they behave, folding themselves creating 3D structures and binding to others persistently in a very specific way, even replicating themselves under certain conditions. Regardless of all the power of modern science to explain them, and of technology to investigate them, we still wonder at the mystery of life.

The existence of life on Earth is a great wonder for science because long molecules do not assemble from smaller ones spontaneously very easily unless there are other long molecules around (i.e. enzymes) to facilitate the reaction. Karl Friston's hypothesis tries to explain how the first cell enclosure might have appeared. He proposes mathematical equations modelling the process with the forming of a Markov blanket from the primordial soup<sup>22</sup>, but the link from there to the first eukaryotic cell is not found yet. The evolution theories try to explain how those primordial structures have turned into more complex life through natural selection and other mechanisms, and eventually led to the existence of a human being on Earth. Evidence in support of evolution through natural selection is overwhelming but not conclusive and the theory itself has been constantly evolving since Darwin first proposed it<sup>23</sup>.

The long organic molecules, lined as fragments in the correct order, can encode a message<sup>24</sup>. DNA is one such extraordinarily long molecule built from just four chemical units, the amino acids Adenine, Cytosine, Guanine and Thymine. In the human body they encode in digital form

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<sup>22</sup> Friston, K., Life as we know it, *Journal of the Royal Society Interface*, 2013, 10: 20130475, (Find in [http:// doi.org/10.1098/rsif.2013.0475](http://doi.org/10.1098/rsif.2013.0475))

<sup>23</sup> Darwin, C. *On the Origin of Species*, 1859

<sup>24</sup> Tortora, G. J., B. Derrickson, *Principles of Anatomy & Physiology*, Wiley & Sons, 2011, pp.44-58

important information not only about reproduction but also about growth and functioning of the organs, about how to synthesise particular proteins needed for energy release, repair of damages and all physiological functions, including how to engage with our environment. These astonishing mechanisms take place inside the human cell.

It is known that each cell of our bodies contains the same genetic information encoded in approximately three billion letters. An adult human body contains about 30 trillion cells. However, cells composing different organs differentiate during development in such a way that they have different regions of the DNA expressed in them. A gene is a region in the DNA molecule containing thousands of letters, which is responsible for the production of a particular protein by the cell. Different genes are active in different cells, a mechanism which is also controlled by specific codes in the DNA. Only about 2% of the DNA encodes for specific proteins produced or targeted by the cell, approximately 21000 in total.

At the simplest level intelligent behaviour in nature can be recognised perhaps in the regulatory and controlling functions of very primitive single cell organisms, which help keep them alive, like euglena for example. There is perhaps a cumulative law leading to intelligence. It is only when there is a consistent common goal pursued by a number of separate inner entities of a system, when we could say there is some sort of purposeful control or intelligence, like in the euglena or the collective work of the billions of cells in the brain, which support not only basic homeostasis, but help the body to survive in a hostile world by intelligent decisions and forceful actions. Animals like chimpanzees, dolphins, dogs and many others can be very clever, but it is only humans who are typically able to receive and store information for extended periods of time in their brains and on some media outside of it. The key to higher intelligence is the ability to turn that information into knowledge and skills used for living. Humans can do this with a high degree of abstraction and logical analysis, able to learn, plan and solve complex problems. It is widely accepted in science that humans developed such

a high degree of intelligence in a long process of evolution, but how it relates to our conscious being is not known and this is a highly contentious area in philosophy. Life, certainly in its intelligent forms, is rare in the universe if not exclusive to our planet.

Intelligence is usually linked to thinking, which is about using our mind actively to form connected ideas. That suggests human activity because many disagree that machines can have minds. On the other hand, the Oxford dictionary defines intelligence as the ability to acquire and apply knowledge and skills for some purpose. Now that includes machines as well, but intuitively there is a scope for gradation depending on how powerful this ability is. Most of us agree that all living matter has a certain level of intelligence. Even plants are not excluded from having some form of intelligence as they react to the environment and even, as it turned out recently, exchange information with others in order to stay alive.

The building blocks of the human brain and the entire nervous system are the nerve cells<sup>25</sup>. A cell in a developing embryo, which is instructed by its DNA to turn into nerve tissue, differentiates in such a way that it elongates its enclosing membrane in one direction to form an output (axon), and in other directions - inputs (*dendrites*). Axons of cells connect to the dendrites of other cells via junctions (*synapses*) where a neurotransmitter substance is produced to help discharge the incoming impulses. Thus a network of connected neurons is formed. Some of the inputs are inhibitory, others are excitatory. The membrane of the cell develops in such a way as to be able to conduct electrical impulses. The cell would send an impulse on its output, when the required level of excitable signals is received on the inputs, taking into account also the inhibitory ones. It means the synapses acts as a threshold, which implies digital signalling, in other words by switching, not by gradual change. However, the threshold levels in the dendrites can be changed gradually with the use of chemical substances released by glands or other special

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<sup>25</sup> *ibid*, pp.447-486

cells, so the function of the nerve system is said to be mixed - digital as well as analogue.

In 1943 Warren McCulloch and Walter Pitts<sup>26</sup> tried to model the nerve structure of the brain with logical functions. By interconnecting artificial neurons, modelled mathematically, they studied the class of information processing tasks these networks could solve without knowing exactly how the human brain actually worked. Later research simulations on computers have found that threshold circuits could do a good job in pattern recognition and in identifying images of different objects. However, learning and cognitive tasks were impossible without propagating signals backwards, which would allow the network to register different stages of the learning process (in other words, to memorise past experiences). The McCulloch-Pitts work was part of the effort to invent the modern computer and was mainly motivated by the desire to find an entirely non-numerical, non-algorithmic alternative to information processing in the quest for universal computation. The mainstream effort was based on numerical algorithms and digital processing. Alongside it was the method of analogue computation. Surprisingly, neuroscience later revealed the power of the mixed digital and analogue nature of the human brain and the mystery of how the electrical signals going through the networks of neurons and synapses in the human body act to control something in a coordinated, calculated way as needed.

The whole human body is richly supplied with nerves, structured in different, relatively autonomous systems. While some neurons in the human body are sensory, carrying information about temperature, sound, touch, pain etc. to a place where it is processed, others are motor, carrying signals from a nerve centre to muscles, causing them to contract or relax. The largest system, involved in control of all others is the brain<sup>27</sup>, anatomically structured in five lobes: four of them form the

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<sup>26</sup> McCulloch, W. Pitts, A Logical Calculus of the Ideas Immanent in Nervous Activity, Bulletin of Mathematical Biophysics, 1943, Vol 5, pp. 115–133

<sup>27</sup> *ibid* 24, pp.527-574

*cerebrum* (frontal, parietal, occipital, temporal), and the fifth one forms the *cerebellum*. These are in fact pairs of lobes since the cerebrum is also divided left to right in two separate hemispheres, which are only connected physically in the base by a structure called the *corpus callosum*. It provides limited neural connectivity between both so that they work with some degree of autonomy.

Brain tissue is not sensory and therefore painless. It processes sensory signals originating from the rest of the body. Each location of the body is mapped in great detail to specific locations of the brain. There are body functions which are controlled from a number of ganglions spaced outside the brain: along the vertebral column, the guts, various glands and others. They control functions which are neither under voluntary control nor affect full conscious awareness: digestion, sweat and salivary glands, heart rate and force, constriction and dilation of blood vessels, blood pressure and many others.

The outer layer of the brain lobes (grey matter) contains neuronal cell bodies (nuclei) whereas the inner space (white matter) contains the tracts (the axons of these cells) which make various connections. This part of the brain is called the *cerebral cortex* to distinguish it from the so-called sub-cortical structures, contained elsewhere in the brain tissue and having a mixture of both: nuclei and tracts.

There are about 86 billion neurons in the brain. Each of them has on average 7000 synapses. This gives some idea of the complexity of the organ carrying our intelligence. Neuroscientists are working hard to analyse in great detail how all these systems work and interact with each other. The knowledge about the human body is increasing fast. So far, they have managed to create detailed models of whole-body organs and systems like the auditory system, heart and circulatory system, pancreas, liver, mobility, vision. However, knowledge about the physics of memory, thinking and learning functions in humans is still quite primitive. Using advanced methods of brain scanning, neuroscientists could only find so far which areas of the brain are excited when a particular human function is exercised. These methods allowed for making a step forward, from

purely Freudian psychoanalysis based on the 'black box' method of investigation via conversations, to accurately measurable observation of neural activity, correlating it to corresponding physiological functions and psychiatric responses.

The autonomy of the left and the right hemispheres of the brain sometimes expose two underlining personalities. Such behaviours have been described and studied from different aspects by psychiatrists, theologians, psychologists, and alike. They found that the left tends to be more rational and analytical, while the right is more creative, artistic and imaginative. It may be that whole communities and nations have developed different cognitive and psychological traits and behaviour depending on the dominating power of their left and right brains. For example, Greek and Jewish schools of thought as suggested by Jonathan Sacks<sup>28</sup>, or Western and Eastern cultures<sup>29</sup>. This is in many ways controversial since studies found that neural circuits in the brain can develop or shrink depending on the exposure to learning and the environment; gene-expression also depends on the environment<sup>30</sup>; the brain has a remarkable plasticity<sup>31</sup>. We have to be careful not to make simplistic conclusions as to whether the genetic traits created the cultures or vice versa. Attempts to overemphasise the material (body) over the non-material (the mind) can lead to wrong conclusions with undertones of racism.

The major body parameters (vital signs): pulse rate, body temperature, oxygen levels, respiration rate and blood pressure are subject to coordinated control from the autonomous system, which requires a significant neural activity, especially during acute conditions. The power of the autonomous system and the brain to process information, not just human response to cognitive tasks but including the control of

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<sup>28</sup> Sacks, J. *The Great Partnership*, Hodder & Stoughton, 2011, pp. 41, 44-45, 56

<sup>29</sup> *ibid* 10

<sup>30</sup> Finlay, G., *Interaction between genes and the relational environment during development of the social brain*, *Science and Christian Belief*, Vol. 30 (2) 2018, pp.102-115

<sup>31</sup> Doidge, N. *The Brain that Changes Itself*, Penguin Books, 2008

autonomous physiological functions, is difficult to estimate in terms of numerical computations because the human body is a non-numerical real time system. It is difficult to test too. An estimate, based purely on the number of neurons and their nominal switching speed, comes in the order of 100 trillion calculations per second. This is a very impressive figure, compared even with the fastest supercomputers in operation today and those planned for release in the near future.

The cerebral cortex is undoubtedly home of human thoughts and memories, but how they are related to our emotions and feelings to form our intelligence and to create the experience of consciousness is a highly contentious subject. Intelligence in humans is obviously deeply entangled with human consciousness.

### **The Physiology of Consciousness**

There are deep problems in defining consciousness and I will explain the reasons as we go along. It is linguistically described as a state of being aware and responsive to one's surroundings, the world and itself. According to this working definition modern neuroscience found that most regulatory acts in species are unconscious. Their purpose undoubtedly is to keep the organism in a state which is inside the boundary of allowable states. This set of states is established by the evolution of the particular species over a very long period of time. States outside this boundary are either unhealthy, eventually leading to death, or present an immediate threat to life. In that sense the regulatory mechanisms are similar to the concept of process control in engineering, where the systems we build use a deviation from the required value to form an error signal. This is used to take a correcting action by changing some parameters of the controlling function so that the process stays under control. In living species this mechanism is called homeostasis. The set of signals in humans monitored for deviation are called *affects*. Those which are felt consciously are called *feelings*, the rest are called *needs*. Studies in psychiatry and neurosurgery so far found that conscious regulatory acts rarely occur and only for a short period of time.

In regards to cognitive tasks we are largely unaware of what we perceive and learn, deeming it subconscious.

Perhaps all agree that consciousness is an essential part of human identity. One of the goals of psychiatry and neuroscience today is to create an information model of the brain and in fact the whole body, that could model human behaviour as adequately as possible for analytical studies in diagnostics, treatment and healthcare. Naturally they strive to investigate and explain the physiological basis of consciousness. The results are explanations of mental arousal and sentience, but not necessarily consciousness in the broader understanding of the term. Understandably the theoretical model that is available at the moment is not at the level of individual neuron states because of the vast number of components and complexity of the interconnections. However, it helps find the nature of sentience and the relationships between physiology of the body, instincts and feelings.

Feelings are difficult to research because they are inherently subjective, but some neuroscientists believe that, like animal instincts, objectivity can be achieved via statistical experiments over a large number of subjects. This is how the law of *classical conditioning*<sup>32</sup> was discovered in the past and found true for almost any animal. But there are actions which we take wilfully by involving cognitive work: enquiring, analysing, taking decisions and acting accordingly. These functions are found to be performed in the cerebral cortex but are still not well researched. However cognitive functions are relatively slow in engineering terms and they are 'called' only in situations of uncertainty, when the automatic business of regulation is ineffective.

Feelings like hunger, thirst, sleepiness, muscle fatigue, nausea, coldness, urinary urgency, the need to defecate and the like, are hedonically valenced, while the sensory ones: vision, hearing etc., are not. Needs are different from feelings in that they can be regulated automatically and

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<sup>32</sup> Pavlov, I. P., *Conditional Reflexes*, 1927 (Find in <http://psychclassics.yorku.ca/Pavlov/>)

unconsciously. For example, the vegetative functions: cardiovascular, respiratory, thermoregulation, glucose metabolism. Some of the needs, can also be felt and then they become conscious, requiring and guiding voluntary action in uncertainty. Apart from bodily needs there are emotional needs, which are more difficult to identify and quantify.

According to the model described by Mark Solms<sup>33</sup>, drawn on Panskepp<sup>34</sup>, the brain states can be reduced to 7 affective states (basic emotions): LUST, SEEKING, RAGE, FEAR, PANIC, CARE, PLAY and 5 senses (perceptual consciousnesses: sight, hearing, touch, taste, smell). Mind-wandering is a spontaneous forebrain activity also known as 'resting state' or 'default mode', which occurs in the absence of any external stimulus.

The physiological basis of conscious arousal is controlled by the so-called decision triangle, formed by three subcortical nuclei: RAS (Reticular Activation System), PAG (periaqueductal grey) and SU (superior colliculi), located in the upper brain stem. This control is based on affections and represents an extended form of homeostasis. According to the current theories not all mental activity is conscious and not all consciousness is cortical. Arguably it is not the cortex that gives rise to it. Cortical consciousness depends on the arousal from the brainstem. The term arousal here, as elsewhere in neuroscience, is used as a synonym of consciousness.

There are three stages of arousal: coma, vegetative state, fully responsive wakefulness. In a clinical environment they can be detected by EEG signals. When a person comes back to a normal state of mental arousal after general anaesthetic, this can be clearly indicated by the EEG pattern because of the sudden increase of the level of integration between an enormous number of neurons communicating to each other. In research, physiological arousal is measured with the metabolic rates shown on functional magnetic resonance image scan (fMRI). The main difference

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<sup>33</sup>Solms, Mark. *The Hidden Spring*, Profile Books Ltd, 2021, pp. 105-121

<sup>34</sup>Panskepp, J., *Affective Neuroscience: The Foundations of Human and Animal Emotions*. New York; Oxford University Press, 1998

between vegetative and coma state is the preservation of wakefulness in vegetative state but without responsiveness (oxymoron). The shift from vegetative to affective state seems to be controlled by the PAG. These states are important in decisions for life support in healthcare and law. In effect they form an ostensive definition of one of the major aspects of consciousness - mental arousal. Any non-ostensive definition of consciousness is unsuitable for legal purposes because it would be morally unreliable.

An attempt to explain the origin of consciousness from an evolutionary aspect with the Free Energy principle is made by Garhart-Harris and Friston<sup>35</sup>. In it the mechanism of homeostasis in human physiology is intertwined with Shannon's theory of information. According to the Second Law of Thermodynamics, the amount of useful energy in a system runs down as the entropy increases. Homeostasis in living systems creates a force which tries to resist entropy by keeping its internal physical state within a set of allowable internal states thus limiting the pressure from the outside world to go chaotically into 'any state'. Friston argues that the intentionality of the living systems is an expression of the same force by which any system is trying to reduce its 'free energy'. He believes that natural selection gives rise to intrinsic aims and purpose for survival and reproduction, which lead 'naturally' to the cybernetic principle of 'self-organisation'.

In this line of thoughts, a conclusion is made<sup>36</sup> that the centre of monitoring and control of most regulatory homeostatic functions, including our sentience, is in the brainstem (the midbrain specifically), while the cortex is responsible for our full wakefulness and voluntary conscious behaviour. However, for this it depends on sub-cortical structures like RAS, PAG and SC, located in the brain stem. The cortex is also the centre of our thinking and cognitive functions, our intelligence. The mechanism of perception and action is from the inside outwards, a

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<sup>35</sup> Garhart-Harris, R. and Friston, K., The default mode, ego functions and free energy: a neurobiological account of Freudian ideas, *Brain*, 2010, 133: 1265-83

<sup>36</sup> *ibid* 33, pp. 122-147

type of Bayesian prediction test. The brain creates a probabilistic expectation inferring the most probable causes for the incoming signals, and then acts according to the current needs, on the difference between expectation and reality. Some neuroscientists consider this to be the most efficient mode of acting in the world for minimising free energy.

This is the current understanding of the information processing taking place in the brain and human behaviour on a physiological level, according to some neuroscientists. Although the area is highly contentious and arguable there is a consensus on significant parts of the hypothetical high-level models. But why the objective model of this physiology is accompanied with a subjective phenomenal feeling in our mind is not clear. Neuroscience here argues with itself but also with philosophy, because in retrospect the term consciousness also involves the concept of the mind, which is thought to go beyond the realm of matter, which can be empirically observed and tested. These topics will be considered in Part 2 of the survey.

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## **Book Reviews**

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<https://scienceandchristianbelief.org/>

**Philip Hefner**

***Human Becoming in an Age of Science, Technology, and Faith***

Lexington Books/ Fortress Academic 2022. 237pp, hb £77, ISBN 9781978708372.

This book is authored by Philip Hefner with contributions from other thinkers and edited by Jason P. Roberts and Mladen Turk. I found the collection very controversial.

HUMAN  
BECOMING IN AN  
AGE OF SCIENCE,  
TECHNOLOGY,  
AND FAITH

PHILIP HEFNER

EDITED BY JASON P. ROBERTS and MLADEN TURK

Hefner's portrayal of the traditional Christian understanding of creation as passive—not creative—is something I cannot accept. He places traditional Christianity in the categories of 'Two Worldviews of Denial' (31), while the roots of his own philosophy he sees in the categories of 'Worldviews of Constructive Interpretation' (32), represented mostly by the very controversial panentheistic philosophy of Pierre Teilhard de Cardin. As many other neo liberal philosophers, he also misinterprets Paul's teaching about the Spirit and the flesh in Romans 8 as

demonising the material order (31). In fact, what Paul says is that believers are called to act in the world according to God's purpose (Rom 12:2) and in the context of Jn 17:11,15-16, they are called to be *in the world* but *not of it*, rather transforming it. Indeed, one cannot take Paul's teaching out of the context of the rest of Bible, especially about Jesus giving authority to humanity to act in the world according to His purpose (Jn 14:12-14).

In Part 1 Hefner speaks about 'An Emerging Concept of God' and 'New Worldviews, New Interpretations' (34). I welcome his assessment In Chapter 4 that the 'crisis of technological civilisation' cannot be dealt with a 'worldview of progressivism'. His call for humility against cynicism

and against the hostility towards 'the Other', against segregation and marginalisation of African Americans and American Indians, as well as his solution proposal for 'relating the World to God' (55-62), are all constructive views. However, instead of offering hope in the crucified and resurrected Christ, a direct resource from the Bible, he rests his theological resources in 'religious traditions' and 'the great 20<sup>th</sup> century...Teilhard...' (64).

In his manifest Hefner largely ignores the fact that at the moment governments and politicians are seeking wide consultations on the issues involved in genetic engineering. The technology of germline editing with CRISPR is not yet accepted in therapeutic practice in most countries, including the US and the UK, yet he is quick to join those who unconditionally affirm it unrestrained by declaring that '...our behavior for all practical purposes, affirms the transhumanist program" (70). By overemphasising human 'functioning' and intelligence, without going into the details of psychological categories like personhood, consciousness, human dignity, purpose, and ethical tendencies of the human nature, he puts forward his 'General Principle' (70), in effect declaring humans identical to machines, which tomorrow unconditionally will be creating other humans without restraints and without certainty of the outcomes. This is strongly controversial and of great concern. Although germline editing of humans is expected to be eventually approved for healing purposes in humans, after clearing all technological risks, its use for human enhancements will continue to be subject of great concern in the times ahead. Many theologians and ethicists, including those of secular transhumanism, consider such intentions far ahead of its time, posing an existential risk to humanity, and requiring extreme caution.

Part 2 contains contributions from other authors, supporting Hefner's fundamentals with no critique. There is nothing in the new discoveries of science and the technological advancements per se, that requires correctives to the eternal Biblical message of salvation through love for the other, yet Jason Roberts is trying to 'review the concept of the

Creator'. In his opinion 'Major shifts in ontological frameworks—from permanence to process, from substances to systems--must be allowed if the concept of *God* [his italic] is to remain scientifically tenable' (115). Further on, this school of thought is trying 'to use the idea of dynamic systems to reconfigure a basic Christian idea about *God*—a Western idea about God—namely that God is Spirit.' (117). The attempt to modify our Biblical narrative in order to have, in his words, 'scientifically credible idea of God' (118), actually is profaning the divine and the supernatural in our understanding of a transcendent God, who is distinct from His creation and is not 'a process', taking its course in time. Proposing 'God...[to be] understood as an evolving system' (120) is deferring from God who we know from the Bible, the One who created time and space and Who should not be described purely as a process in that material world. In fact, his description can never be made full from within the material world He created without falling into the trap of circumferential causation in philosophy. Hefner's school of thought implies a god as a concept in our minds and shies away from God, who is the source of all our faculties, who's wisdom we seek.

The leitmotif of this book, termed 'becoming' is inappropriate, challenging a fundamental Biblical statement, that God had already created humans (mankind) (Gen 1.26-27). Although humans are still evolving and maturing, they are not 'becoming' as such. Some established terms are inappropriately used too. We must not use the term 'eugenics' in the context of genetic engineering due to the reminiscent of the horrific events in recent history, which took place in the Nazy camps. Even with good intentions we should never 'practice eugenics unabashedly' (178) but be humble, prayerful and sorrowful when we sacrifice an animal, zygote, embryo or foetus, any living thing, for whatever reason, even when the end goal is to alleviate human suffering, save lives or heal. We are prayerful also when we kill animals for food. That is why we give thanks to God before we eat. However, the spirit of this book does not offer praying and worshiping the true living God because it seeks to 'propose' a god as it fits the humans of the day.

I must acknowledge the insightful analysis of the crisis of the technological civilization of some of the other contributors, who's 'diagnosis is not quite isomorphic' with Hefner's (201). Still the proposed resolution to 'place a spirit of communal well-being into the driver's seat of technological innovation' (207) suffers from the same malaise of circular logic as that of baron Munchausen. We shall not put a spirit in the driver's seat, but *invite* the Spirit of our transcendent uncreated God to renew, transform and inspire us to drive the technological innovation along His way.

**Todd Kantchev is the Reviews Editor of S&CB.**

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**Victoria Lorrimar**

***Human Technological Enhancement and Theological Anthropology***

Cambridge: Cambridge University Press, 2022. 356 pp. hb £75.69. ISBN 9781316515020

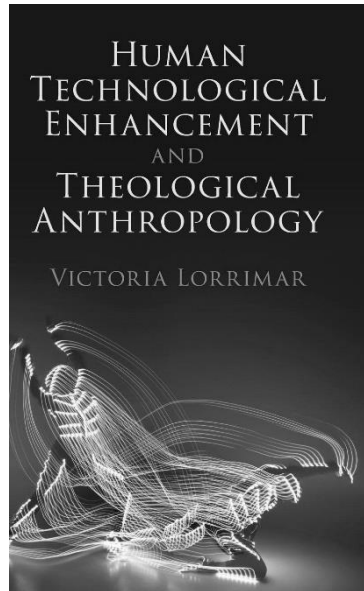
Citing recent advances in gene editing, nanotechnology, and the field of artificial intelligence, transhumanism, posthumanism, and the effective altruists believe, we stand on the brink of a new humanity, one that will be technologically altered to enjoy a longer lifespan, defeat disease, and possess expanded mental, physical, and even moral abilities. For philosophers and theologians, this raises numerous questions, including: Perhaps we can enhance human nature in these ways, but should we? How might we evaluate a given enhancement to determine if it is desirable or not? Should we eschew human enhancement as "playing God?"

Victoria Lorrimar answers the last with a definitive "No!" Her work is a paean to human creativity, approached first through a thorough examination of humans as "created co-creators" with God, a concept introduced by Lutheran theologian Philip Hefner in 1984 and explored in *The Human Factor* (Hefner, 1993). For Hefner, being a created co-creator situates humans as God's creation, through evolution, yet a creature that possesses, via our technologies, the unique ability to create

ourselves, as we modify and manipulate our environment, our fellow creatures, and, increasingly, our very selves. Lorrimar traces the development of the concept of the “created co-creator” through Hefner’s work and into the broader field of science and religion. She critiques Hefner as limited by a scientific, more specifically, Lakatosian lens, whereby technological creativity is viewed as a product of our progressing scientific knowledge and little else.

Lorrimar posits imagination as a necessary companion with knowledge in driving technological creation and transhumanist visions of human enhancement. She notes how these visions are most thoroughly explored in the imaginative worlds of science fiction and film. Thus, she turns to the literary world for an understanding of the role of the imagination in creation, honing in on J. R. R. Tolkien’s concept of “sub-creator” as both a parallel to and expansion of Hefner’s created co-creator. Tolkien distinguishes human creativity from divine creativity in that we, as sub-creators, do not create *ex nihilo*. Rather, the works of our imagination reveal truths already extant in God’s creation, “breaking through the limitations of preconceived response, and revealing an essentially sacred reality” (181). In this sense, she breaks from Hefner, noting Tolkien’s assertion that we create within divine norms and limits.

In the final section, Lorrimar suggests that linking knowledge with imagination, the rational with the narrative, might give us a new perspective from which to evaluate and direct a transhuman future. In her final chapter, she sets out to apply this dual perspective to a selection of biological technologies, such as radical life extension, mind uploading, and moral enhancement. However here, she once again falls back of



covering the extant literature and thus, falls short in demonstrating how linking knowledge with imagination might help theologians, scientists, or political bodies determine a path forward regarding particular paths toward human enhancement. Rather than advancing a defined position on any technology, she presents a list of commendable, yet general rules of thumb but fails to demonstrate how to apply these rules in a concrete way.

As a literature review of what it means to be a creator, both scientifically and artistically, this work is a remarkably thorough compilation, perhaps reflecting the requirements of the doctoral dissertation from which it is derived. That is both the book's strength and its weakness. At the high price of £75.69 for both hardback and ebook, *Human Technological Enhancement and Theological Anthropology* is likely to be purchased mainly by libraries and used as a reference. However, as I read, I could not help thinking of the words of the founder of Quakerism, as recorded by Margaret Fell: "You will say, Christ saith this, and the apostles say this; but what canst thou say?" Lorrimar's exhaustive treatment of the extant literature buried her own position. I would have liked to have heard less from the numerous scholars Lorrimar quotes and more from Lorrimar herself.

**Noreen Herzfeld is the Nicholas and Bernice Reuter Professor of Science and Religion at St. John's University and the College of St. Benedict.**

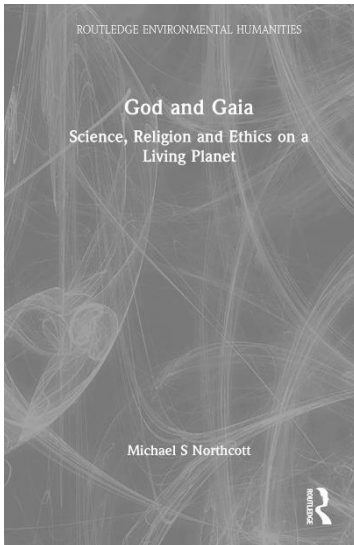
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**Michael S Northcott**

***God and Gaia: Science, Religion and Ethics on a Living Planet***

Oxford: Routledge Env. Humanities, 2023. 271 pp. pb £34.99. ISBN 9780367627744

Michael Northcott is well known as an environmental campaigner, who has long drawn attention to the ways that humans are degrading the biosphere and the planet on which we live.



This book is a continuation of those themes. The chapters draw heavily on conference papers he has previously published on a variety of topics, and reads as a series of somewhat disconnected topics, including an extensive chapter on COVID-19, rather than as a single through-going argument. In his own words, Northcott writes that 'This book is an attempt at a dialogue between the Hindu, Hellenic, and medieval Christian religio-cultural sensibility of the agency of the Great Chain of Beings, which includes the Divine origin of all things emanating

divine forces or spirits; angels; humans; and all other creatures, including Gaia/Earth, and the scientific theory of Gaia/Earth as a living system or network of agencies' (43 – 44).

If there is an over-riding theme that came through to me, it is Northcott's intense dislike of global governmental bodies and industrial organisations, and top-down governance which he perceives as using issues such as the Covid-19 'pandemic' [his quotation marks] and climate change, and indeed science itself as excuses for ever-increasing social control and profiteering. This polemic seriously detracts from his main arguments. Northcott also continually complains throughout the book about scientism. Now I agree with him that scientism (the view that everything can be explained ultimately without the need for any supernatural agency), is indeed a kind of new atheistic religion. But science itself doesn't need to, and indeed should not carry that baggage. When the Royal Society, the world's first scientific institution was started, the founders explicitly stated in their 1663 charter that their 'studies are to be applied to further promoting by the authority of experiments the sciences of natural things and of useful arts, to the glory of God the Creator, and the advantage of the human race'. For many of the early

Fellows of the Royal Society, and indeed for many scientists today, this dual aim of giving glory to God by using scientific insights for the good of humankind fitted exactly with their religious and ethical perspective of the world. I sought in vain for any mention in Northcott's book of the benefits that science has brought to humankind – such as the fact that smallpox has been eradicated from the world after having killed an estimated 300 million people in the twentieth century alone, or the medical benefits that give us healthier and longer lives, to name but two.

Many readers will be surprised by Northcott's certainty that SARS-Cov-2 is 'a chimeric virus unleashed on the world from a bio-weapons laboratory in Wuhan, the development of which was funded by a globalist partnership between US development and scientific research agencies and Chinese Communist research funding agencies' (89). He goes on to claim that 'The globally interlinked and highly invasive restrictions on normal human life and social interactions which followed in almost every nation revealed a novel level of global political and technological coordination' (90). Though it remains a possibility amongst several others that the virus escaped from a laboratory in Wuhan, a more commonly accepted explanation for the presence of this virus in humans, as for others previously, is that it jumped via an intermediary animal from a bat population due to the encroachment of humans on the living space of wild animals, and the forced proximity of wild animals in the unsanitary conditions of a meat market in Wuhan or elsewhere. Surely these latter explanations would fit equally well with Northcott's concern about the deleterious role of humans on the natural environment without descending into conspiracy theories. Northcott goes on to claim that the mRNA vaccines developed to counter Covid-19 were driven largely by the profit motive of large pharmaceutical companies, providing 'a financial bonanza of trillions of dollars' , and that the vaccines 'have an exceptional record of injury, including death' (140). This despite carefully peer-reviewed research in the Lancet and elsewhere that these vaccines saved an estimated 20 million lives in just the first year of vaccination.

Likewise, readers might be astonished that Northcott agrees with a 2014 statement by Lovelock that since 2000 'global average surface and atmospheric temperature has hardly warmed at all' (231). This is hardly a tenable view in light of data that show global temperature records being broken on an almost annual basis, with 2023 likely to be the hottest on record since humans have trod this Earth. He ignores the painstaking work of many tens of thousands of scientists worldwide when he asserts that there is not sufficient evidence to claim that climate change 'is principally caused by greenhouse gas emissions from humans and their animals' (247). He decries 'climate change alarmism' (231), and the 'global false alarm of climate change' (231). That would be small comfort to the relatives of the estimated hundreds of thousands of people already dying annually from the effects of overbearing hot weather, or climate driven extreme weather events such as floods and droughts – all of which affect the poor and disadvantaged most.

If we can get past the distractions of Northcott's minority (and dare I say it, unscientific) views discussed above, what about his main suggestions concerning, as he puts it, that 'The main "takeaway" of this book for environmental concern is that humans are not alone in their efforts to restore the Earth from the ecological damage industrial activities have inflicted'. His view is that 'contemporary humans need to recover a sensibility for, and revive the capacities of, all Beings – the Earth, mammals, fishes, plants and soils, and the divine Life force working through them – to restore the Earth to the state of species abundance which filled most of the Earth's surface until the colonial and industrial eras' (3). In his final chapter he puts forward three 'sacred postulates that moderns should adopt and for which they might construct rituals of care in every human community and habitat' (247). These are, first, water-catchment governance, including 'revivals of traditional water-blessing ceremonies by the leaders of local religious traditions' (257). Second, soil conservation and the suggestion that 'churches and temples have a responsibility to revive the now mostly forgotten ceremonies of blessing of the soils, food, and farming' (259). And the third and final 'ultimate sacred postulate' is species diversity. Contrary to the views of most

people concerned to reduce the impacts on greenhouse gas production of huge numbers of domesticated animals, Northcott advocates 'a huge increase in the numbers of carefully managed domesticated animals, and reintroduced wild animals, on lands that are at risk of desertification' (260). He wants religious traditions to revive 'the co-agency of all species, and all Beings, including Mother Earth or Gaia, in recomposing Earthly habitats' because 'Gaia urgently needs to replenish and revive her innate living powers of planetary healing' (261, final sentence of book).

I agree with Northcott that we have lost much indigenous knowledge stemming from a time when people lived in rural communities that were much closer to the earth than do most people today. But I have my doubts as to whether these three postulates are sufficient to provide a good quality of life to Earth's population of over 8 billion and rising, especially when more than half of them live in cities rather than rural settings. But maybe it's a start.

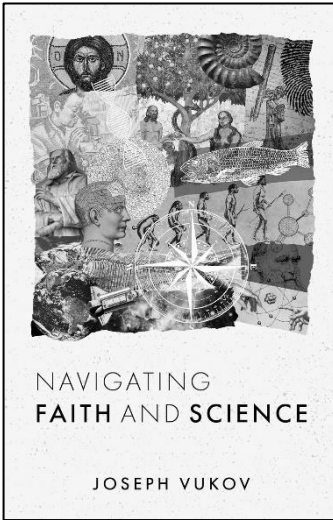
**Robert White, FRS is Emeritus Director of The Faraday Institute for Science and Religion and Emeritus Professor of Geophysics at Cambridge University.**

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**Joseph Vukov**  
***Navigating Faith and Science***

Grand Rapids, Michigan: B. Erdmans Publishing, 2022. 179 pp. pb £16.  
ISBN 9780802879615

Joseph Vukov is Assistant Professor of Philosophy and Graduate Program Director in the Philosophy Department of the University of Chicago. This book presents a fresh, novel and well-argued view of the relative merits of the Conflict Model, the Independence Model and the Dialogue Model as descriptors of the relationship between science and faith.



Although the author agrees with the majority of the SCB readership that the Dialogue Model is to be preferred as the best descriptor of the ideal relationship, the originality of this book is the proposal that in the context of the limited knowledge of humans, each of the three models can be thought of as imperfect tools which could in turn be “right for the job”, according to their relevance to the given situation.

The author starts out by confirming the view that as science and religion are both endeavours aimed at discovering an accurate and holistic nature of reality, that ultimately there can be no conflict between the scientific and religious findings. He asks the reader to imagine an angelic being who can see the whole of physical and spiritual reality and sees how the two relate to each other. Vukov uses the two phrases “truth is one” and “truth unites; it does not divide” to reference this idea as his argument proceeds.

The author argues then that by contrast, there is a disjoint between our human lived experience of the relationship between the spiritual and the scientific (“is”), and what the ideal relationship should be (“ought”). He then argues that it is helpful to acknowledge the lived experience of conflict (or of independence) between our science and our faith, as this then means that the experience of conflict or independence can be “navigated” – discussed and analysed -- rather than denied from the outset. He also suggests that in many cases, in a limited context, the common experience of conflict or independence might in fact be the most appropriate approach, unless the goal is to then reflect and attain a deeper understanding.

The author argues next that this discrepancy between *is* and *ought*, arises because of our limited human understanding, and therefore to

navigate this successfully, we absolutely need intellectual humility, as this then paves the way to considering the merits of other models and how one might approach an integration between science and faith. He defines intellectual humility as a clear-sighted awareness of both the extent of and the limitations of a person's knowledge and understanding.

Each of the three models (Conflict, Independence and Dialogue) is then examined in turn, and scenarios given where the common experience is either conflict or independence. Vukov suggests that even the Dialogue Model sometimes has the weakness of elevating dialogue for its own sake above the endeavour of discovering truth. He calls this the "kumbaya" effect, and suggests this can suppress robust argument in cases where there is a misunderstanding which needs to be identified.

The style is fresh and fluent, although requiring focus due to the progression of the argument. The author uses scenarios taken from famous paintings as well as science, notably using the simile of a painting that has one impression when viewed up close up, and a different and more inspiring message when viewed from afar. The most memorable image is that of Icarus fallen, where the "fall from pride" is not even noticed in the wider picture. Vukov's engaging discourse, by focusing only on the task at hand of navigating the real world and using imperfect tools to acknowledge our limited experiences, neatly sidesteps the whole issue of pride and hubris. Instead, the reader is invited to pick up the tools and have a go themselves in the final section of suggested discussion questions.

The book is suitable for the general reader, and is also sufficiently academically robust and theologically orthodox to be of help both to students of the philosophy of science and potential authors for SCB.

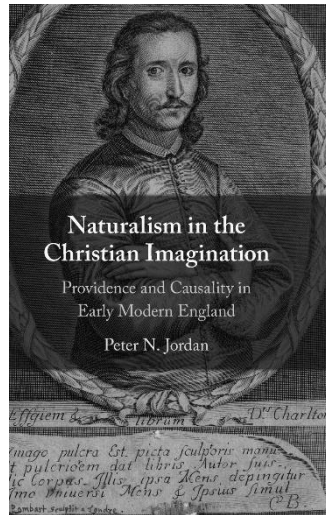
**Dr Christina Biggs is a Daphne Jackson Research Fellow at the Energy Safety Research Institute, Swansea University, working on green hydrogen, and a former local group leader for CiS Bristol.**

**Peter N. Jordan**

## ***Naturalism in the Christian Imagination: Providence and Causality in Early Modern England***

Cambridge: Cambridge University Press, 2022. 218 pp. hb £69.78. ISBN 9781009211987

The breadth of theological opinions in seventeenth-century England is notorious. The Civil War allowed previously marginalised voices a chance to be heard while the relative toleration of the Restoration meant that the borders of orthodoxy were porous. In the book under review, Peter Jordan has examined one important concern of writers on divinity during this period: the question of providence or, how God provides that the world does what He wants it to do.



Part 1 of the book, *Setting the Scene*, is an excellent summary of the ways that God was thought to interact with nature. Peter Jordan presents a clear taxonomy of avenues through which the subject could be approached by Christians. Methodological naturalists leave their religious beliefs at the laboratory door, regardless of their commitments outside it. This is the usual position of religious scientists today. By contrast, providential naturalists recognise God's government of the world when they consider the workings of nature. Jordan defines 'providential full naturalists' as those who claim that He acts only through natural causation. 'Providential partial naturalists' accept that, while natural causes are the dominant mechanism in the world, God does sometimes intervene, either by causing miracles or directing the outcome of natural events. Jordan also touches briefly on 'occasionalism', the doctrine that God steers the world moment by moment, although this idea receives little attention here.

There was clearly a spectrum of early-modern providential partial naturalists, and much of Jordan's book is made up of following the debates between them through books they wrote. The first topic covered is the extent God controls the outcome of lotteries and games. Many people have issued a little prayer before rolling a dice, and providentialists would certainly maintain that God could affect which number comes up, if He desired it. One moral objection to games of chance in the early-modern period was that God Himself was being pulled into the lists, either because players believed He was influencing the result or because He actually was.

Thomas Gataker, a Rotherhithe vicar, disagreed. He saw dice as subject to natural causes and essentially random. James Balmford, a rector from Southwark, took the more traditional view that God could be directly involved in apparently random events. That said, their disagreement was not as great as might be imagined. Both men accepted that God might intervene directly if he wished, and both agreed that natural causes, even when they operated without direct divine intervention, required God's concurrence.

Other writers extended the debate. John Spencer of Corpus Christi, Cambridge challenged the idea that God communicated through apparent prodigies (from earthquakes to fountains running with blood) and other unusual events. Spencer also asked what He was supposed to mean by them if He was causing them to appear. Atomism and cosmology were other topics that brought to light similar issues. Thomas Burnet, for instance, went so far as to explain the deluge in Genesis according to natural causes. The question in all these cases was to what extent God's purposes were brought about by natural causes rather than through supernatural agency.

None of these writers were asserting that God was not the ultimate cause of what happened on earth or that events could run contrary to his purposes. However, the overall effect of the enquiries that Peter Jordan considers in this book must surely be to reduce God's immediate

interactions with the world. Deism seems the next logical step, as indeed it was.

The main drawback of this book is that it wears the imprint of the PhD thesis upon which it is based rather too clearly. It's arranged as an introduction, followed by four independent chapters of research and then a conclusion. Each chapter is the fruit of a close reading of relevant early modern texts, but these chapters run on too long for a reader interested in seventeenth century science and religion in general rather than the debate on providentialism in particular. The conclusion of the book is especially disappointing because it reads more like a summary than the punchline of an argument. The book ends by noting that providential naturalists attributed events to natural causes even when they couldn't say what those causes actually were. This sounds like an important part of the history of methodological naturalism, but the idea remains undeveloped.

Overall, the clarity of Part 1 is well worth the time of anyone concerned about early-modern English science or religion. There is certainly material in the rest of the book to furnish informative articles that could further advance our understanding of these subjects. Unfortunately, a monograph was not the best format to present this.

**James Hannam is the author of *The Globe: How the Earth Became Round* (Reaktion, 2023)**

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**Neil Laing**

***Is God Really Legit? Making sense of faith and science***

Watford: Instant Apostle, 2018, 160 pp. pb £8.99. ISBN 9781909728837

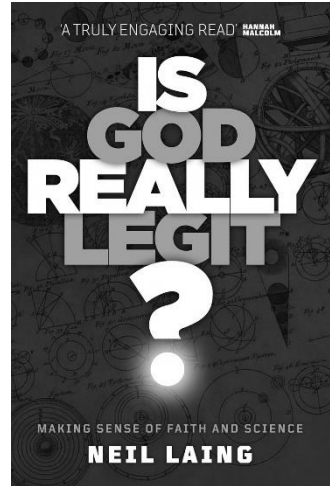
*Is God Really Legit?* is an informed, easy-to-read, address of science and faith topics aimed at teenagers. However, the book will benefit anyone who prefers non-academic writing and appreciates colloquialisms. The author, Neil Laing, a secondary school science and IT teacher in the UK, tells 'The Author's Story' in a meaningful preliminary element, which includes his Christian testimony. Although not at the same time, Laing

and Richard Dawkins, attended the same Zimbabwean primary school. I appreciate the author's humble approach: 'As far as I am concerned, as long as anyone has genuine biblical and scientific evidence to support what they believe, I respect their view, whether or not I agree with them. I really will be amazed if I find I am completely right' (63).

Most of the fifteen short chapters address a 'big question'. These chapters include: 'What is atheism?'; 'Can we trust the Bible?'; 'Doesn't evolution disprove creation?'; 'Surely seeing is believing – and I can't see Him?'; 'Is there any proof of God?'; and 'Why would a good God allow suffering?'. Additional questions throughout keep readers thinking and guide them towards making an informed decision on the relationship between science and religious faith. One such question is 'Would Adam and Eve have been created as adults or as

new-born babies? Either way, what would this imply?' The topic of Christian faith is of inevitable relevance to the topic of the book and is specifically treated in chapters such as: 'What is faith really about?' and 'Faith in action'. The back matter in the book includes sections on 'Famous scientists who are Christians' and the 'Top ten questions asked by teenagers' from research conducted by 'God and the Big Bang' (<https://gatbb.co.uk/>). Laing responds to each question in a brief paragraph, most of which have been dealt with more fully within the book chapters.

Laing makes the important point that the main message of the Bible is not to explain scientific mechanisms, but rather the Bible is God's communication with us (41). Furthermore, both the Bible and science look at people, the world and life, from different angles. Thus, non-scientific, including biblical, explanations of a concept or phenomenon, can still be true; they are just from another perspective. For example, a



rainbow can be described scientifically in terms of light being refracted by raindrops; aesthetically a rainbow can be described as beautiful; and from the Bible it can be said that it reveals the glory of God (Ezek. 1:28). Each of these descriptions can be regarded as true and complement each other. Laing made some valuable connections between the evolution of the universe and the Bible. One example is God created and 'stretched out' the heavens (e.g., Jer. 10:12), which connects to evolution's expanding universe. Another example is 'The earth was without form and void, ...' (Gen. 1:2), which connects to the theory that the earth was formless during the process of being formed from gases orbiting the sun which then cooled to form liquid then solid. I appreciated the conjecture on God creating humans (58-60): 'God took creatures which were highly intelligent animals and breathed into them the breath of life so that they become living souls' (Gen. 2:7). In other words, God made humans spiritual, having the 'ability to know God'. I thought the last chapter on suffering is a commendable address of a very difficult topic within a short chapter. Laing tells moving stories from personal experience. He rightly includes a central idea to this topic that 'God gave us free will' and we are not programmed robots. Also, Laing admits that the topic of suffering would be increasingly difficult for the person who does not leave room for God in their understanding and only views it from a human perspective.

Despite this selection of positive points, I have a couple of minor criticisms. In reading the first eleven chapters it could easily be misunderstood that Christian faith is purely human effort. Even though we are told later that faith is initiated by God (111) it may have been an idea to make the different aspects of Christian faith clear earlier in the book. The other is with the chapter on 'Faith in Action', which is predominantly about miraculous healings and miraculous provision, usually as a result of prayer. It would have been beneficial to give an appropriate amount of space to the more ordinary ways of demonstrating faith in action. Living as a radical Christian disciple in the mundane and with Christian relevance in the community may be the primary example.

I commend this book to young and old alike, and not just the Christian.

**Malcolm S. Buchanan is a Secondary school science teacher in Brisbane, has a doctorate in chemistry, and his interests include the relationship between science and religious faith.**

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**Marjorie Lindner Gunnoe**

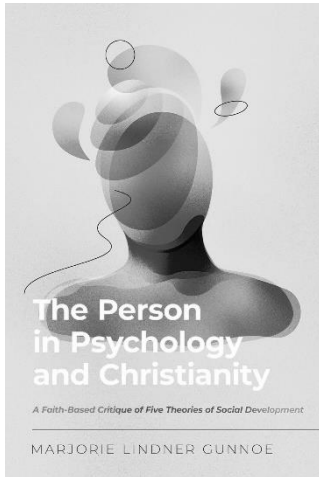
***The Person in Psychology and Christianity: A Faith Based Critique of Five Theories of Social Development***

Illinois: InterVarsity Press, 2022. 247 pp. pb £20.69. ISBN 9780830828722

Marjorie Gunnoe seeks 'compatibility' between her biblically guided, Christian depiction of an embodied, purposeful, moral, accountable person made in the image of God, and the C20th developmental psychology theories of Eric Erikson, John Bowlby, B.F. Skinner, Albert Bandura, and Evolutionary Psychology (EP). Systematically and carefully reading their work through the grid of this anthropology, she firmly and unequivocally rejects those parts that her scripturally based approach rules out. Positive features include the well-structured chapters and subsequent consistent and thoughtful application of her schema. I liked the informative biographies of each thinker as well. They not only add colour, but also illuminate the theological and psychological influences on and motivations of her theorists. Gunnoe diplomatically steers a sensible course through the US culture wars too when discussing sexuality and gender, avoiding the excesses of some contemporary misunderstandings.

But whose Christianity, which psychology are in play throughout the book? It transpires that a modern protestant faith variant is being used to adjudicate the overall *theological* acceptability of what tends to be presented simply, and maybe a little uncritically at times, as a modernist discipline. Biblical 'facts' deployed to sift scientific facts from scientific factoids we might say. How convincing this rather positivist encounter proves depends partly on one's place in the Christian family; denominational positioning does matter in these debates I'm afraid.

One's stance on faith and reason's relationship is particularly crucial, as is confidence in whether Gunnoe's filtering strategy is practicable in the long term, (an obvious alternative being a more nuanced *dialogue* between two rational traditions, theology and psychological science, mediated by and through philosophy).



I wondered how others might respond to the outright rejection of uncomfortable aspects of psychology on biblical authority alone, such as developmental psychology's ignoring the *imago Dei* or any notion of ultimate purpose. A reading such as Gunnoe's rules out their acceptance definitively and unequivocally. But on what shared, reasonable grounds will this approach be accepted, or even treated as remotely credible by those sceptical of biblical inerrancy claims, especially if made by some flavours of evangelicalism? How might one use Gunnoe's method to educate an afflicted tradition, psychology in this case, of the identity of and cure for its epistemic fallacies in a language it might come to understand and accept? If the answer is 'one can't' there remains only rhetorical posturing for the many outside what is arguably a narrow, confessional fold, with preaching to the choir for those within. This inevitably restricts the reach and readership of this book, foreclosing its usefulness as part of any wider apologetic or intellectual endeavour.

To be fair to Gunnoe, the target audience is not meant to be so wide. As intended, her book may well prove to be a necessary, useful, and crucial text for many a US Christian College fresher or sophomore or similar at a particular stage in *their* maturation and development. For those formed by fundamentalist, religious outlooks, or who need urgent assistance with their arrested or compartmentalised religious and intellectual formation, this monograph probably will refresh the parts

that a free church, Biblicist background cannot reach. It will engender a healthy respect for certain scientific as well as religious routes to truth, and it can only encourage a compassionate understanding of the socio-political implications of the interpersonal and relational, whether theological or psychological. It will act as a partial prophylactic against contemporary travesties of faithful truth-seeking that eschew all commerce with secular understanding of the person. For all this it deserves a cautious welcome and recommendation. But it will most likely prove a curious read, with a somewhat dated feel, for anyone in the longer and broader Christian (especially catholic or orthodox) tradition, particularly those educated in both psychology and theology, and who are comfortable with both Athens and Jerusalem and their complex philosophical and theological connections.

Derek Mahon, the late Irish poet, wryly described himself as a 'recovering protestant'; the author of *The Person in Psychology and Christianity*, describes herself as both 'Reformed and reforming'. In Mahon's case the radically fallen, objectified, dead world characteristic of some strands of Northern Irish Christianity and post Newtonian science, became meaning-infused as his poetry teetered on the brink of the transcendent and a participatory ontology. Gunnoe, still largely in sympathy with the radical reformers, is keen to counteract unduly negative views of the person associated with certain strands of the Calvinist tradition. So far so welcome. Behind both, however, often lurk the spectres of other common, modern, but potentially unhelpful dualisms including the nature-culture, faith-reason, and subject-object splits. In his mature years, these receded in the rear-view mirror for Mahon, while some might wish for similar distancing here. This, I suspect, will be needed for similar engagements with psychology to be more widely accessible in future.

**Peter Hampson is Emeritus Professor of Psychology, UWE, Bristol and SCR Member of Blackfriars Hall, Oxford with interests in moral psychology, theology and psychology, and theology and culture.**

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**Timothy M. Mosteller (ed.)**

***Four Views on Christian Metaphysics***

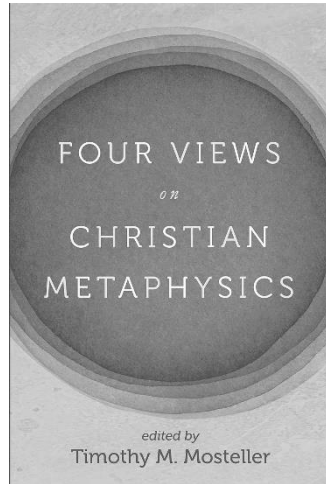
Eugene, Oregon: Cascade Books 2022; 142pp. pb £20.25. ISBN 9781725273306

Human wisdom gets a rather bad press in the New Testament (e.g., Matthew 11: 25-26). However, the New Testament is not totally against wisdom but states it is found in a place few intellectuals think to look, namely the person of Christ crucified (Colossians 2: 3, 1 Corinthians 1: 22).

Judged against this gospel, how does the book under review measure up? Before answering this question, we need to describe the book. It consists of four chapters written by four different men each seeking to persuade the reader that

their chosen metaphysic should be *the* Christian philosophy. These four are (in the order considered) Platonism, Aristotelianism, Idealism, and Postmodernism. All the authors were required to finish their chapter by considering how their metaphysic handles the resurrection. After each author has made their case, the other three critique the arguments advanced. The author of each chapter then responds to their criticisms.

The four metaphysics may be summarised as follows: (i) Platonists hold that there are two parts to reality, physical and non-physical, the non-physical realm being where universals (such as redness) reside; (ii) Aristotelians hold that universals do not exist if there are no examples of them in the physical world (e.g. 'redness' would not exist if there are no red things); (iii) Idealists hold that there is only one kind of substance, not two, and that in order for something to exist someone (usually God) has to perceive it; (iv) Postmodernists reject the concept that metaphysics is an analysis of a reality 'out there' but rather is an



interpretive task in which universals are simply names we agree upon in our use of language.

The question may be asked why Mosteller chose this four metaphysics? The reason he gives in his introduction is that they are the most prominent among Christians today.

Up until the chapter on Postmodernism, the debate was conducted in a gentlemanly manner. The debate then got heated with the Aristotelian attacking Postmodernism thus: 'For all its effort to study the meanings of words, it does more to obscure them' and 'Subjectivist language obscures the truth'. 'If [Postmodernism] is not concerned with metaphysical questions, then I will stick with systems that provide answers.' The Idealist finishes his critique of Postmodernism by stating: 'So is a truly Christian postmodern perspective actually just an excuse to avoid doing serious metaphysics? From where I stand, that would appear to be the case'. In his response to the other three authors, the Postmodernist points out that none of the four metaphysics being considered should be considered to be Christian. 'All four systems include, or may include, beliefs that do not line up with the teachings of Scripture, or that flat out contradict it'.

What is most helpful about this book? In my opinion it is that you will find here an accessible summary of the main differences between universals in Plato and Aristotle.

Reading this book will not make you great in the kingdom of heaven. For according to Jesus in the Sermon on the Mount, that privilege belongs to '*...whoever does [the commandments] and teaches them...*' (Matthew 5: 19) and, more amazingly and unexpectedly, children (Matthew 18: 1-4 and Mark 10: 13-16). Nevertheless, if you have a God-given gift of intellect, reading this book may make you more useful to both Christians and non-Christians, so long as after you have read it you remain able to make a simple and straightforward gospel presentation (Acts 16: 30-31) '*Then [the Philippian jailer] brought [Paul and Silas] out*

and said, "Sirs, what must I do to be saved?". And they said, "Believe in the Lord Jesus, and you will be saved, you and your household".'

**Stephen Walley is a retired research physicist associated with the Cavendish Laboratory, University of Cambridge**

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**John C. Lennox**

***Cosmic Chemistry: Do God and Science Mix?***

Lion Books, 2021. 400 pp. pb £25. ISBN 9780745981406

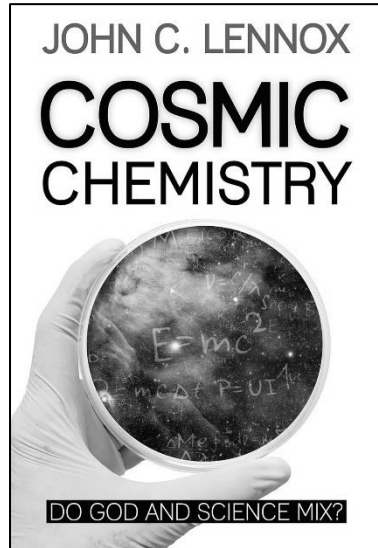
John Lennox will be well-known to many readers of S&CB. He is a brilliant Christian apologist and has successfully debated new atheists such as Richard Dawkins and Peter Atkins. His books *Gunning for God* and *Can Science Explain Everything?* are widely read and greatly appreciated. He is rightly held in high regard as a Christian speaker and debater, with immense knowledge, charm and clarity. As this book is written by someone who is so highly regarded, it is natural to assume this new publication will be another masterpiece. However, we need to think carefully and critically about the contents of this book, for in my opinion it contains some flaws and incorrect or inappropriate arguments concerning evolution. Lennox is a mathematician and philosopher; this book is about biology and chemistry.

The first chapters engagingly cover familiar territory and criticise the 'nothing-buttery' of scientism. Claims that science might be able to explain everything are convincingly refuted, as in Lennox's previous books. Arguments for the existence of God based on fine tuning and the origin of the universe (why there is something rather than nothing) are clearly presented. However, most of the book is an extended argument for 'design' in biology. By this he means much more than seeing the Creator's hand in everything. Instead, this is a defence of Intelligent Design (ID) and is a critique of the adequacy of the standard model of evolution. He is not denying that things evolve, and he is very clear that he is not invoking young earth creationism, but he is highly critical of the modern evolutionary synthesis, known as Neo-Darwinism.

Lennox is careful to explain the difference between evolution and the origin of life (abiogenesis), which are very different areas of study. There are indeed very few convincing arguments for how living organisms might have arisen from non-living material (though there are plenty of speculations), yet many of Lennox's arguments concern the latter, especially questions about the origin of information in DNA and where that might come from. There is no mention of the RNA world, and nothing on endosymbiosis, let alone the

difference between prokaryotes, archaea and eukaryotes. Lateral gene transfer and convergent evolution are other aspects that are not mentioned. Lennox invokes the role of a 'designer' to explain the complexity, which he claims cannot be explained by evolution.

The author claims that he is not proposing a God-of-the-gaps, but yet seems to invoke a 'designer of the gaps' to account for the complexity of the biological world. At whatever level biology is studied it is complex, whether at level of DNA sequences, protein structure, cell biology or developmental biology. Biologists take this for granted and stand in awe of the amazing complexity of all life. There is nothing in the cell that isn't amazingly complicated! However, we no more need to invoke anything miraculous to explain evolution than we do to explain the development of baby from a single fertilised cell. He cites the bacterial flagellum as an example of irreducible complexity; though the main proponents of ID have moved on from this example, for which plausible evolutionary models have been proposed. He even claims that 'science is uncovering the design, but not simultaneously revealing any convincing natural processes to account for it' (162). In other contexts, he ignores the facts that we have learned about retroviral insertions, which convincingly



demonstrate the evolutionary relationship between different species. His argument that genetic relationship is only a 'relatedness of the gaps' (256) makes no sense, as too is the claim that reverse transcription weakens the role of the genome in inherited characteristics (269). All this ignores the designer's role in the rest of biology, which has not been 'designed' in the same way. This is rather different to the usual Christian understanding of the creator God who is intimately involved in every aspect of creation.

Lennox proposes his own definition of 'science' so that it can include unrepeatable divine activity, and so stands against the legal ruling of the Dover court case, which concluded that ID is not science and that ID 'violates the ground rules of science by invoking supernatural causation'. He sets up a false dichotomy between 'atheistic' evolution and philosophical naturalism making the implicit assumption that evolution is necessarily atheistic. Of course, Christians will be wary of strict naturalism, as nothing exists without God's involvement, but that does not mean that evolutionary mechanisms are necessarily atheistic.

In several places (too many to list here) Lennox's arguments are in error, or are exaggerations. His statements about the evolution of the peppered moth are simply wrong; the molecular basis for this small change in phenotype, leading to a change in population, have even been mapped to the level of a single DNA transposition. Natural selection is not only about competition for limited resources between the strong and weak, but about reproductive fitness.

There are many quotes from Dennis Noble and Thomas Nagel (neither of whom are theists, though both have criticised the standard evolutionary model) and he makes great play of the Royal Society discussion meeting on 'New trends in evolutionary biology: biological, philosophical and social science perspectives' which was held in 2016. That one called for 'revision of the standard theory of evolution, although the issues involved remain hotly contested'. His book doesn't explicitly mention the Extended Evolutionary Synthesis (EES) which addresses some of the 'top-down' questions that were posed, but which

'does not replace traditional thinking, but rather can be deployed alongside it to stimulate research in evolutionary biology'.

Lennox invokes arguments from information theory and makes the classic error of arguing as if proteins or long stretches of DNA assembled in a single step, purely by chance (like assembling a Boeing 747 from a scrapyard). But that is not what evolution is claiming; rather that the various stages occurred incrementally, and that successful ones were preserved, allowing for further improvement. Nothing started in the optimised state in which we find biology today.

He mentions systems biology and invokes 'jumping genes' (transposons) and epigenetics as if these give evidence for interference by the designer. These do indeed give added complexity to the mechanisms of evolution, and call for some new approaches, but they are very far from claiming that evolution is a theory in crisis, as Lennox seems to suggest. Epigenetics gives added levels of complexity for development and control, which are inherited in a non-Darwinian fashion, but these do not go any way to producing any new information or refuting the main mechanisms of evolution. He invokes 'systems biology' as if this helps his case, without explaining how. This is merely an aspect of biomedical research which tries to understand things at the level of cells/tissues/organisms by putting the pieces together, in contrast to reductionist approaches, which take things apart.

Many readers of S&CB will see this as a well-meaning departure from Christian understanding of God's role in Creation. In the biblical view God is much more than a divine tinkerer who occasionally steps in to overrule natural processes. He gives no hint of how the 'designer' went about his business – by miracles that defying the known laws of science, or maybe by individual new acts of creation or by loading the dice to enable the less likely? Arguments from quantum uncertainty (occurring at the subatomic level), generally don't work at the molecular, or higher, levels of biology

This is not such an easy read as Lennox's previous work, and it necessarily contains far more technical terms. Read it for yourself and reach your own conclusions, but beware – this does not represent mainstream biological science. The subtitle of the book is 'Do God and Science Mix?' Lennox's conclusion is yes (and I wholeheartedly agree), but he claims this while denying much of contemporary evolutionary science. This can only cause confusion.

**Keith Fox is Editor of Science & Christian Belief, Emeritus Professor of Biochemistry in the University of Southampton and former Director of the Faraday Institute for Science and Religion in Cambridge.**

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**Graeme Finlay**

***God's Gift of Science: Theological presuppositions underlying exploration of the natural world***

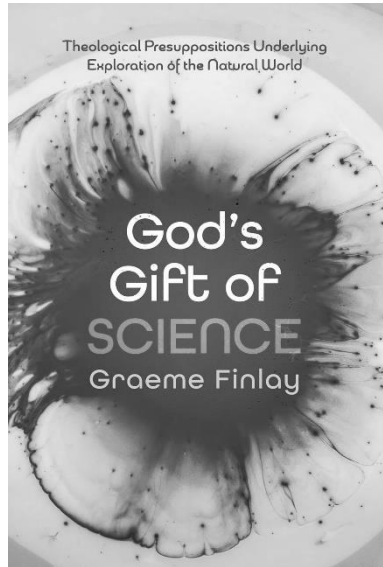
Eugene, Oregon: Cascade Books, 2022. 143 + xii pp. pb £19. ISBN 9781666748062

Graeme Finlay works in the field of cancer research and scientific pathology. *God's Gift of Science* is perhaps best read as a series of reflections on the ways in which science and the Christian faith, which are so often presented as inimical to one another, do not need to be seen in this way but might rather offer jointly visions which address the malaises of contemporary Western society.

Finlay sets out his ideas in six chapters. The first covers the nature of science: Finlay here maintains both that 'science cannot justify its own existence' (14), and that, historically speaking, 'The human enterprise of science rests on the bedrock of biblical faith' (19). The second is a reflection on the idea of creation and the understanding of God as creator that emerges in the Judaeo-Christian tradition. The third, similarly, is a reflection on the nature of humanity: here Finlay ponders *inter alia* issues around biblical hermeneutics and critical realism. These opening chapters have a rather piecemeal feel: they quote extensively

from other authors, and it is hard to discern what is being added to these sources.

Things pick up with the fourth chapter, which discusses 'threats to science' in the contemporary world. Finlay sees these as coming from the use of technology to support vested power interests, postmodern thinking with its critiques of science as a tool of Western imperialism (Finlay suggests that '[w]hen people speak (disapprovingly) of European *science*, they probably mean European *ideologies* that are often dressed up as science' (60, italics in original), and the attacks made on scientific findings by powerful



lobbying groups such as those associated with the tobacco and fossil fuel industries. In a 'post-truth' society, Finlay urges, 'the remedy is not to place our hope in science, but to return to the God upon whose truth science is most securely founded' (68).

A fifth chapter looks at the way in which both scientific and theological findings can generate surprise in those investigating these areas, whilst the sixth chapter explores issues of sustainability and justice from scientific and theological standpoints. Here Finlay draws on the work of economist Bill Rees and theologian Michael Northcott to offer a penetrating analysis of the current ecological crisis, an explanation of it in terms of the models of humans and the environment provided by Enlightenment thinking, and an alternative rooted in the Christian Gospel. Finlay concludes that '[Jesus's] call for justice in place of acquisitive living supplants consumerism. To adopt Jesus's paradigm is to gain inner motivation to live sustainably and justly' (115).

Finlay frequently refers to 'biblical faith', which he understands as 'a commitment to a way of living that is based on the biblical narrative – especially the story of Jesus' (49), but he is no naïve biblical literalist, commenting of the creation narrative that 'evolution ... has compelling evidential support, ... and that the biblical concept of creation must encompass every conceivable natural process' (67).

There can sometimes be a clashing of the gears on moving between theological topics (discussions of which are often heavily indebted to a handful of scholars such as Tom Wright, and regarding which Finlay's position tends to the conservative) and some of the scientific material, of which Finlay's handling is rather more assured. Many of the topics discussed here have been extensively covered elsewhere, but Finlay's final chapter – comprising a third of the entire book – is both challenging and timely, and the arguments presented here deserve to be widely heard.

**Michael Fuller is a Lecturer at New College, University of Edinburgh: he is also a Fellow of ISSR, and Vice-President for Publications of ESSSAT.**

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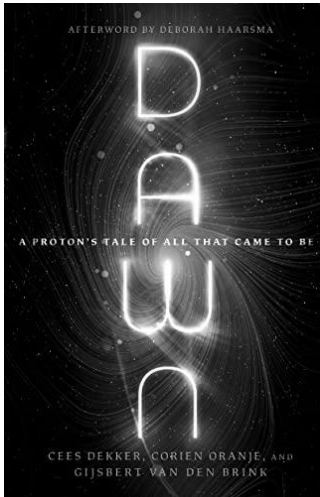
**Cees Dekker, Corien Oranje, and Gijsbert van den Brink**

***Dawn. A Proton's Tale of All That Came to Be***

Downers Grove, Illinois: IVP Academic, 2021. 295 pp. pb £14.63. ISBN 9781514005668

This book is the English translation of a book published in the Netherlands in 2020. It is jointly authored by a professor of nanobiology and biophysics, a novelist and theologian, and a professor in theology and science. The book provides a narrative that combines the scientific story of creation with the story of God's redemptive involvement in human history and in His creation. The story is told from the perspective of Proton, a proton who witnesses the origin and evolution of the universe, the origin and evolution of life on Earth, the origin of human

beings, and the birth and life of Jesus and the beginnings of the Christian church.



The story is told in 24 short chapters. Chapters 1 to 7 cover the history of the universe and the history of life on Earth in accordance with our current scientific understandings. Proton is formed in the Big Bang, becomes part of a helium nucleus, ends up inside a star, and through nuclear fusion becomes part of a carbon atom. The star becomes a supernova, the carbon atom is ejected into space, becomes part of a dust particle, and ends up in the water on Earth. Proton, as part of the carbon atom, then becomes part of a variety of living organisms and witnesses

key events in the evolution of life on Earth.

The story then moves towards the history of mankind and God's involvement in this, covered in chapters 8 to 22. This part of the book covers the essentials of the biblical narrative. As part of the carbon atom Proton ends up in a bamboo cane, and meets the first humans. As time progresses Proton meets a number of biblical characters including Abraham, Josua and David, and witnesses key events in the birth, life and death of Jesus. Chapter 22 ends with the beginnings of the Christian church and the discussion of God's plans by the apostle John with his friend Gaius.

In chapter 23 Proton is in a space station and follows the discussions about God amongst the five astronauts on board. These discussions reflect the current discussions in religion and science. Proton and his friends (the other protons and neutrons in the carbon atom) end up on the gloves of one of the astronauts, and during a spacewalk find themselves back in interstellar space after billions of years. In chapter 24, as Proton and his friends drift further and further away from Earth, they

recap the six eras that they have experienced: The Big Bang and the first moments after that, the formation of stars and galaxies, the origin and evolution of life, the emergence of human beings, the coming of Jesus, and the coming of Breath (the Holy Spirit). And they discuss God's promise of a future seventh era: the return of Jesus. The book ends with an epilogue in which the authors summarise a number of the discussions they have had in the writing of the book, and a set of discussion questions.

This is a delightful and inspiring book that is easy to read, and a scientific background is not needed to appreciate it. In simple and engaging language, the narrative covers the essentials of the Gospel. The synopsis of the history of the universe and evolution of life on Earth is true to current scientific understandings. In this way the authors effectively endorse the relevance and harmony of the two books of God's works: the book of the Bible, and the book of Nature.

The choice by the authors of a proton as the narrator of the story is a very clever one. In the ongoing recycling of atoms and molecules in nature, Proton as part of the carbon atom becomes part of a variety of objects and creatures. These include different plants and animals, the sheep skin of Abraham's tent, one of the strings of David's harp, and Jesus' walking stick. This enables the authors to make Proton and his friends witnesses of all the key historical events.

In many parts of the book, Proton and his friends discuss the events they witness, in particular in relation to God's plans for the redemption of mankind. They voice excitement, concerns, misunderstandings and doubts, and in this way, they draw the reader into the story and induce the reader to think for him- or herself about the relevance of these events. This book is highly recommended, a must-read for both Christians and non-Christians alike.

**Peter J. M. van der Burgt is emeritus associate professor in the Department of Experimental Physics at the National University of Ireland Maynooth.**

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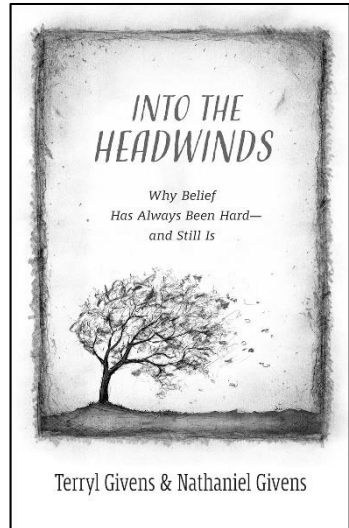
**Terryl & Nathaniel Givens**

***Into the Headwinds: Why Belief Has Always Been Hard—and Still Is***

Grand Rapids: William B. Eerdmans, 2022. 132 pp. hb £15.99. ISBN 9780802882431

The Givens ask two questions in this book: What are the challenges to faith? Are they particular to this modern moment? Here, ‘faith’ is defined as loyalty—maintaining religious commitment (e.g., beliefs) beyond being easy or costless (vii). Briefly, their answers are: The challenges to faith do not come from specific ‘truths’ of secularism but are rooted in the limited, biased, and fallible operations of our mind; these challenges are not particularly modern—hence ‘why belief has always been hard’.

The title of the introduction, *Secularism Is Not the Problem*, is quite telling. Here, the Givens debunk the secularization hypothesis (myth of scientific enlightenment), which says life was hard in the dark times before the Age of Reason; religion fed on the people’s ignorance and fear, offering tales that made life tolerable; science, however, exposed the folly of religion and led to great intellectual, moral, and technological progress (2-4). According to the authors, this theory is implausible for many reasons, such as that Christianity did not make life easy; it instead required countercultural aspirations and demanded costly material, social, and ideological sacrifices (9).



But if the secularization hypothesis is wrong, why has religion declined? The Givens argue for the counter-intuitive: because the choice to believe has become too easy (9). The secular age is not one of disbelief per se, but one of casual belief or domesticated religion—religious affiliation

mistaken for genuine conversion. While authentic faith has always been costly, we expect from our affiliation the comforting tales: 'a map of meaning... minimum tension with prevailing social norms... escape from cognitive dissonance, uncertainty, risk, and vulnerability' (12). Consequently, substitutes of faith readily emerge on the market which offer exactly what we want but with fewer personal costs. They are rationalism and scientism; they pose challenges to faith not because secularism is right, but because our religion has gone wrong (11).

Next, the Givens argue that rationalism and scientism are false. Their refutation of rationalism is based on the recent findings of psychology and neurology which support intuitionism (19). People rarely make highly rational decisions, and our mind offers only after-the-fact rationalization (28); we often do not actually believe what we think we believe, and we are ignorant of our self-inconsistency (41). Their refutation of scientism is based on the real character of science—depending considerably on intuition (58), not directly correlated with technology (64), and quite fallible in finding truth (68).

The authors are telling us that rationalism and scientism cannot deliver what they promise; the kind of certainty, objectivity, self-knowledge, and self-mastery which we want are simply unattainable anywhere. Reality is multi-layered, and our mental faculties are fallible (79). So rather than running away from risk and exposure, we should embrace our limitations as part of ourselves—what real faith has espoused all along. Facing cultural, biological, and psychological headwinds, the way forward is to rethink our faith: it is not a proposition, but a disposition of epistemological openness (80). It is a gesture of trust in our diverse faculties of knowing (intuition, conscience, imagination, etc.), which enrich our apprehension of reality (96, 107). It is a personal response to this reality outside us—God in particular—thus it is relational and volitional, making us vulnerable and holding us responsible (100, 110). Then, knowing that the struggle to believe is largely self-inflicted, we can proceed into the headwinds confidently and prayerfully (117), trusting in

our moral and intellectual intuitions and avoiding the stumbling blocks, including over-reliance on reason and science.

The Givens present a valuable insight. However, their finer points are difficult to grasp, as the book is overwhelmingly occupied with introducing and refuting the secularization hypothesis, rationalism, scientism, and other headwinds. The reader's initial impression may be that this is another book lamenting how the champions of secularism misunderstand and abuse reason, science, and faith. If the Givens' message stopped there, we may as well say that secularism is still the problem, thanks to the (debunked) conflict myth, when reason conquered ignorance and science disproved religion. The Givens show that their position is far more nuanced: the problem before us is not what to believe, but whether to trust; there are perennial idols tempting us to withhold trust, avoid exposure, and escape from responsibility. Though the idols change their appearances, running away from faith is nothing new. Alas, the Givens' response to the keystone question—'why is religion apparently difficult in a secular culture'—is very brief, a mere five pages in the introduction.

The Givens can strengthen their case by a greater sensitivity to the diverse meanings of 'secularity'. They quote Charles Taylor but do not engage with Taylor's work significantly (1). Also, if scientific enlightenment is false and is 'not the problem', how our faith has changed (for the worse) requires further elaboration. Is the Givens' picture of an imperial corruption and institutional domestication of Christianity true? Did the early Christians measure faith with authenticity? Did they even think of religion in terms of conversion? I do not find the answers self-evident. Since the Givens' argument depends on an explication of the nature of faith and an analogy between the modern moment and late antiquity, more evidence from church history is necessary.

**Pu Ji (Preston), a science tutor at Mount Mary University, studies theology at Nashotah House Theological Seminary, both in Wisconsin, USA. Drawing on his previous training in diverse disciplines including chemistry,**

engineering, philosophy, and theology, he aims to transform the discourse of science and religion into a ministry of the church and establish it as an integral part of Christian education.

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**Carl Mitcham, Jim Grote, and Levi Checketts**

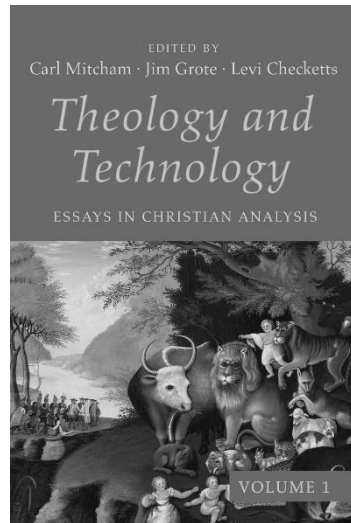
***Theology and Technology, Volume 1: Essays in Christian Analysis***

Eugene, OR: Wipf & Stock, 2022. 174 pp. pb £23.00. ISBN 9781666734621

***Theology and Technology, Volume 2: Essays in Christian Exegesis and Historical Theology***

Eugene, OR: Wipf & Stock, 2022. 272 pp. pb £32.00. ISBN 9781666734638

Through the efforts of Levi Checketts and collaborators, these volumes are a republication of Carl Mitcham and Jim Grote's 1984 edited, largely unattended, collection on the relationship between theology and technology. Checketts states that the goal of revisiting this work is to '[expand] the field of philosophy of technology to theology' (I, xiii), emphasizing his use of these essays as a teaching tool for theology students. While the new preface acknowledges potential challenges to this task, such as rightfully noting that the volumes have a serious 'blind spot' for people who are 'not white, cis-gendered, heterosexual Christian males' (I, xviii), there are other issues which may create difficulty for instructors to use these volumes as a teaching tool. Because the rhetorical strategies used by many of the authors do not meet the standards of academic rigor, in 2023 or in 1984, *Theology and Technology* is more of an interesting artifact from a historical research program which went undeveloped, rather than a

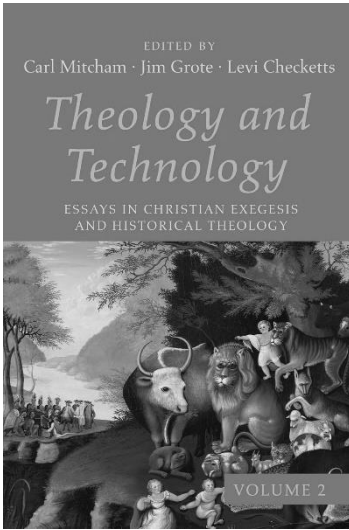


springboard for new scholarship. However, a handful of exceptions shine through which show the potential for the tradition Checketts hopes to regenerate.

Volume 1 contains a series of philosophical perspectives on the relationship between Christianity and technology, as well as two new pieces written for this volume. Volume 2 has sections on biblical studies, classical theology, and technological culture. Issues of method run throughout, where dubious claims and strawmen spoil the arguments made in more essays than I can list: Jacques Ellul (II, 42-59) polemicizes against the *new theologians* and atheists while only citing himself, Wilhelm Fudpucker (I, 25-41) tells us with no supporting evidence that all non-Christian religions are non-historical, non-eschatological, or both, and Egbert Schuurman (I, 77-90) claims that many engineers struggle with aspirations to 'unlimited, megalomaniacal achievements,' (I, 89) which is more a description of a Saturday morning cartoon villain than a woman who make plans for bridges. Instructors deciding to use these volumes to teach theology trainees should ensure their students have enough critical training to identify claims which are not substantiated. Be prepared to discuss issues of questionable biblical interpretation and overly prescriptive conceptions of technology. For potential examples see: (I, 78-83; II, 30; II, 60-61, II, 138; II, 145-146).

The essays that hold up best are ones which implemented historical methods alongside theological arguments. Both Terry J. Tekippe (I, 42-60) and Ernest L. Fortin (II, 99-114) engaged the corpses of other theologians to expound on their relevance to technological questions, Bernard Lonergan and Augustine, respectively. By surveying the works of the mighty dead and contextualizing them with questions about technology, both Tekippe and Fortin created secondary literature which can be used by instructors to introduce these figures to students. Checketts's new contribution in Volume 1 (I, 91-115) pulls from his background in Science & Technology Studies to show how engagement with non-theological literature can anchor novel theological arguments. As Checketts examines the 'sacred technologies' (I, 110) of navigation

tools, the printing press, and the cross, he also places these tools within economic and Christian history. Grounding his research in these histories builds trust with readers, giving people who hold different religious views something interesting to ponder on while building credibility for his theological analysis to those who do not already agree with him.



Were I asked to teach a theology and technology course next semester, I would first question why a heretic like me would be asked to do such a thing, but then accept because these volumes drove me to ask about my own positions on this subject. Checketts suggests supplementing the volumes with Science & Technology Studies literature, and I would also ensure students got a background in the history and philosophy of technology. Kate Stockly and Wesley Wildman's ponderings on "spirit tech" (Stockly, Kate J., and Wesley J. Wildman. "Interpreting the rapidly changing landscape of spirit tech." *Religion, Brain & Behavior* 13, no. 1 (2023): 109-118) deserve attention and I would dedicate a week to Karel Čapek's *The Factory for the Absolute*. Theology and Technology would be discussed as a stage in the history of the field's development, one which continued a tradition worth theologians' time, with Checketts's own essay being a shoo-in for the syllabus.

**Scott Ryan Maybell is a court mediator in the USA with a research background in neurohermeneutics and recognitive analysis, and an MSc degree in Science and Religion from the University of Edinburgh, UK.**

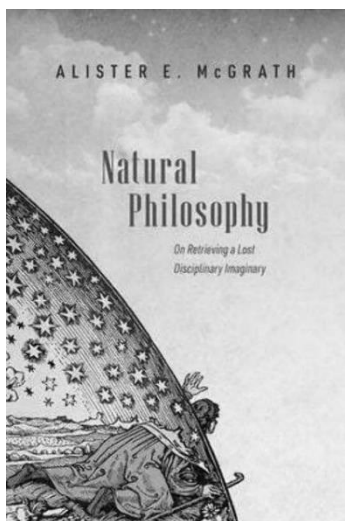
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## Alister McGrath

### ***Natural Philosophy: On Retrieving a Lost Disciplinary Imaginary***

Oxford: Oxford University Press, 2023. 248 pp. pb £32.99 ISBN 9780192865731

'No one should expect great progress in the sciences (especially in their practical part) unless natural philosophy is extended to the particular sciences, and the particular sciences in turn brought back to natural philosophy.' So wrote Sir Francis Bacon in 1620. In 2015, as Professor of Divinity at Gresham College, Alister McGrath set out to retrieve the import of this historic actors 'category'. The result is vintage McGrath. *Natural Philosophy*, with its 60-page bibliography, is a timely *ressourcement* for a goal beyond science or religion. 'A natural philosophy is the grander vision of nature, that arises from transcending disciplinary divisions, affirming the value of all its disciplinary components, while actively seeking to discern the larger picture of nature they disclose' (177).



In Part I, McGrath initiates a conversation with a tradition of natural philosophy, which as practiced, 'was a way of life, not merely an intellectual endeavour' (3). Combining learning *about* nature with learning *from* nature, the subject was oriented to the *knowledge* and the *reformation* of its practitioners as worldly agents. Before it 'bifurcated into "science" and "philosophy"' (91), the discipline sought more than a unified theory of natural "science". If 'the singular term "science" has functioned satisfactorily for many as

a disciplinary imaginary for two centuries' (176), neglect of natural philosophy may explain the plausibility and produce the sensibility of

Stephen Weinberg's saying, 'the more the universe seems comprehensible, the more it also seems pointless.'

Drawing on Charles Taylor's notion of social imaginaries, McGrath's proposal in Part II is not to recover a discarded *theory* but to renew engagement in practices of *theoria* by which the objectivity, open to different forms of subjective engagement (including but not limited to scientific, aesthetic, and ethical perspectives), may be incorporated into the image of reality in all its fullness. Central to McGrath's vision of a natural philosophy is the potential of contemplation (*theoreia*) to disclose what nobody's eyes can yet have seen, except in part. Whence Mary Midgley's insistence on many ways 'mapping reality', Thomas Nagel's integration of multiple 'points of view', Karl Popper's talk of many 'worlds', and Hans Georg Gadamer's of many 'horizons of interpretation'.

There is a tension in McGrath's historical narrative. In chapter 1 we read that 'natural philosophy emerged as a significant intellectual domain in Western Europe in the late modern period '(3), but post- Kantian traditions of *Naturphilosophie* are not the focus of this study. In chapter 2 we learn that natural philosophy was 'conceived by Aristotle as 'an autonomous and self-contained discipline (19), which was consolidated in 'the middle ages', when 'Aristotelian natural philosophy dominated Western attempts to make sense of the world of nature' (30) centuries before Descartes or Newton. Historiographical difficulties are inevitable in the work of retrieval. The conversation with the tradition in Part I is suitably selective, but has a distinctly English flavour. Positions of historical actors are routinely presented via their reception by twentieth century figures, which the publisher's decision to not put the dates of the works cited in footnotes obscures.

The prevalence of 'natural philosophy' as an actor's category is sometimes overstated, and the influence of political economy understated. Galileo, the visionary Pythagorean, waxed lyrical in 1623 of the grand standing of *philosophy* - not [natural philosophy] (60) - being written in the then highly figurative language of mathematics. Keats, the

romantic poet, felt in 1819 the clip of *cold philosophy*. I found McGrath's reading in each case quite unnatural. The 1810 *Encyclopaedia Britannica* does not provide the synonymy he intends (95-96), but serves to show rather how natural historians and philosophers were distinguished by their chief objects in the nineteenth century. It may even help to iron out a few historical details. For example, why McGrath's suggestion that the term 'scientist' was coined to replace 'natural philosopher' (89) would have been *verboten* by Coleridge and Whewell alike; why 'the term 'natural philosophy' is absent from *The Origin of Species*' (101n.); and why Whewell described Darwin's work as 'utterly unphilosophical'. It had nought to do with Darwin's preference for 'a "naturalistic" approach to biological science' (99).

These are minor historical details. McGrath's concern 'lies elsewhere' (12). He anticipates a more basic objection: 'why bother resurrecting an obsolete form of thought in the light of inexorable scientific progress?' (5). Whiggish readers are directed to Maria Rosa Antognazza's demonstration of 'The Benefit to Philosophy of the Study of its History'. It remains to be seen how McGrath's visions for a natural philosophy interact with his visions for a Christian natural theology. "*Theoreia*" finds fertile expression in the gospel according to John, and readers of this journal may notice Hooke's desire to 'furnish the Learned with an *experimentum crucis*' (49n.). More must be said on the subject of *Natural Philosophy*. We may thank McGrath for initiating the conversation.

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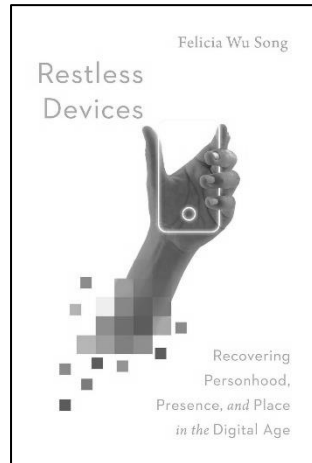
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## Felicia Wu Song

### ***Restless Devices: Recovering Personhood, Presence and Place in the Digital Age,***

IVP Academic, 2021. 232 pp. pb £17.05. ISBN 9780830851133

This book is not what I had expected it to be. Although I did know the book was about social media and its various effects on society at large, I had broadly anticipated discussions of what social media was today, how it was broadly affecting us, its consumers, and describing the various commercial and technological forces at play actively shaping our experiences. Yes, the book is certainly all of these things - but it is also so much more than that, and in a rather surprising way. What I was not prepared for was the richness and depth of discussion contained within, especially for a Christian audience.



The author is Dr Felicia Wu Song, a cultural sociologist based at Westmont College in California who specialises in studying 'the place of digital technologies in contemporary life'. Despite the academic context, I found the writing to be accessible and well-crafted, although somewhat wordy at times. Song carefully communicates her points clearly in an approachable, conversational manner, mostly without using technical jargon, but also with surprising conviction. Even when sociological terms were used, such as 'social imaginary' and 'plausibility structures', they were skilfully explained within context. An index is also helpfully provided.

I found the rather personal introductory chapter to be essential reading, providing overall context and a flavour of what comes later. As said already, I had expected a somewhat different book, perhaps focusing on the downsides of technology and how social media corrupts our souls

and leads us into endless distractions. Fortunately, Song continues further by giving a surprisingly uplifting and positive message, not only acknowledging benefits but equally suggesting ways to examine, diagnose, and even counteract how social media may be leading us astray.

A significant part of practically doing this counteracting is what Song terms 'The Freedom Project'. This consists of four separate coda sections dotted throughout the book that provide helpful suggestions and exercises designed to help attain a greater awareness of how we can use digital media more safely and establish a 'new normal' in its use.

In the first part of the book, Song focuses mostly on sociological aspects, describing what she terms the 'digital ecology', to characterise what digital social media does along with its effects on users, both positive and negative. This discusses the origins of the digital ecology, the landscape of social media and the known inclinations and motives of the usual litany of organisations that operate it. I found myself agreeing vigorously with what was said here. Although quite well-known, Song nevertheless expresses it all extremely well. Despite the known benefits of this digital ecology, those benefits can all too easily come at a true cost to everyone in terms of misdirected attention, spiritual isolation and ever-present distraction.

Reading the first part of the book didn't prepare me for the second part, which goes to form its bulk. Broadly, this opens with two chapters transitioning from the more sociological perspective taken in the first part to the thoroughly Christian theological perspective taken in the second. Song's general observation here is that although technologies like social media broadly provide us with a basic sense of 'connection' with others, often what we are truly seeking is instead a genuine communion with them - that is, being faithfully present in fellowship. In short, the ease and convenience of using social media have persuaded us to accept mere connection as a substitute for what we would prefer, which is communion with those whom we know. Song emphasises that, in a Christian context, communion means being in an abiding

relationship with the Lord as well as with others in our various communities.

The remaining four chapters explore both the consequences of accepting mere connectedness over communion within our communities (such as reluctance towards physical engagement) as well as considerations of how to ameliorate those consequences through applying more traditional spiritual disciplines (such as prayer, lectio divina, intentional habits, etc.). I am particularly grateful here for Song's discussion of what author James Davison Hunter calls 'faithful presence' in Chapter 8. For me, this beautifully summed up what it means to be an intentional Christian.

Overall, this is a remarkable work, one that is immensely timely given its topic and will stay relevant for some time to come. If there is any criticism, the book could have been shorter and yet delivered its message just as powerfully. This book is relevant to church leaders, Christians studying/working in social sciences, theology and philosophy, together with those interested in the use and development of digital media.

**Brian Monahan is a (retired) mathematician, computer scientist and software developer living near Bristol.**

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