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# JOHN POLKINGHORNE ON CREATION

STEPHEN N. WILLIAMS

QUEEN'S UNIVERSITY, BELFAST

## INTRODUCTION

If you were having a thirty-minute coffee break with John Polkinghorne (from now on, JP) in a Physics laboratory in Cambridge in the late 1970s, you were probably asking him what the evidence was for the truth of Christianity. If you were doing that instead of talking theoretical physics, it was because he had announced that he was changing his job in what was not exactly a prestigious career move. Born in 1930, JP was appointed to a new chair in Mathematical Physics in the University of Cambridge in 1968. A decade on, he was seeking ordination into the ministry of the Church of England. After his training and a short period in parish ministry, he returned to Cambridge, first as Dean of Trinity Hall and then as President of Queens' College from which role he retired in 1996. A series of writings over a period of around three decades established him as one of the leading scientist-theologians of our day.

What follows is an account of how he understands creation. His approach to it is embedded in the way that he understands the nature of theology, science and their relationship. In the spirit of pacific and oily conformity, I acquiesce in the widespread judgement that an early trilogy provides an admirable introduction to his thought and steer my exposition of JP on creation, taking my bearings from the middle volume.<sup>1</sup> Because JP emphasizes creation as *creatio continua* and does not sharply distinguish *creatio continua* from providence, it is in principle unsatisfactory in an account of his view of creation to privilege *Science and Creation* over the subsequent volume, *Science and Providence*. However, a glance at the chapter titles in the latter volume – on miracle, evil, prayer, time, incarnation, sacrament and hope – indicates the practical impossibility of

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<sup>1</sup> *Science and Creation: the search for understanding* (London: SPCK, 1988). It was preceded by *One World: the interaction of science and theology* (London: SPCK, 1986) and succeeded by *Science and Providence: God's Interaction with the World* (London: SPCK, 1989). Of *One World*, JP remarked in his autobiography: 'Looking at [...] the book again today, I am struck by how many themes it contains, even if treated in brief, that were to prove recurrent concerns given further and more developed treatment in my subsequent writings', *From Physicist to Priest: an Autobiography* (London: SPCK, 2007), p. 137.

including all relevant material in a single article. Because JP also emphasizes eschatological *nova creatio*, omitting discussion of his eschatology is equally unsatisfactory but equally a practical necessity for the same reason.<sup>2</sup> If I may further bare the self-pitying travails of the conscientious academic soul, hardest to negotiate is the question of treating JP on divine action. Against the fact that my topic is creation and not divine action must be set the fact that JP frequently concentrates his thought on the latter in order to elucidate the inseparable former. The clamour of divine action to appear somewhere in this article is irresistible.

JP's thought has known a degree of change and modification along the way but only one shift is relevant for us.<sup>3</sup> My article is mainly descriptive, but I raise some critical questions at the end.<sup>4</sup>

## OUR WORLD

The title of the first volume in the trilogy is eloquent: *One World*. Science and theology seek, in partnership, to understand it. We can say what the world is like. JP is a critical realist: 'Science is the rational exploration of what is the case'.<sup>5</sup> Although he makes remarks on the philosophy of sci-

<sup>2</sup> JP observes that '[e]schatology is the keystone of the edifice of theological thinking, holding the whole building together', *The God of Hope and the End of the World* (London: SPCK, 2002), p. 140.

<sup>3</sup> For a demonstration of continuity, we should read JP's 'Some Responses' in Fraser Watts and Christopher C. Knight, eds., *God and the Scientist: Exploring the Work of John Polkinghorne* (Burlington, VT: Ashgate, 2012), pp. 267-73 after reading the works which stretch from *One World* through his 'mini-systematic theology', *Science and Christian Belief: Theological Reflections of a Bottom-up Thinker* (London: SPCK, 1994) to his overview volume, *Quarks, Chaos and Christianity: Questions to Science and Religion* (London: SPCK, 1994). The designation 'mini-systematic theology' is found in Polkinghorne's, *Scientists as Theologians: a comparison of the writings of Ian Barbour, Arthur Peacocke and John Polkinghorne* (London: SPCK, 1996), p. 8. Amongst shifts in perspective which do not affect my exposition are his later move in the direction of giving scope to metaphor in relation to model, *Faith, Science and Understanding* (London: SPCK, 2000), p. 84. This bears on the precise formulation of JP's critical realism.

<sup>4</sup> Excluded from my account are JP's popular scientific works although he noted that *The Quantum World*, published in 1984, was the best-selling of all his works and describes *Rochester Roundabout* (1989) as 'the book I have written that comes nearest to achieving what I had in mind in setting out to write it', *From Physicist to Priest*, pp. 65 and 67.

<sup>5</sup> *Serious Talk: Science and Religion in Dialogue* (London: SCM, 1996), p. 35. JP's literature is extraordinarily repetitive so I shall usually give one reference

ence in the course of his defence of critical realism, his realist conviction is rooted in his and his colleagues' experience as practising scientists.<sup>6</sup> Their strong working intuition is that they are discovering things about the world as it is and, if the appeal to intuition be challenged, there remains the question: what can possibly account for the success of science if it fails to attain 'verisimilitude'?<sup>7</sup> JP defends neither a naïve objectivity nor the possibility of discovering ultimate, definitive scientific truth, but he is sure that, in the course of the history of science, there is an actual objective gain in knowledge.<sup>8</sup> His favourite philosopher of science is Michael Polanyi, partly because Polanyi was highly trained in scientific work and did not merely philosophise about it in practical innocence.<sup>9</sup> Theology is also summoned to critical realism, aiming to make sense of the world as it

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where – literally – a dozen or more could be given.

- <sup>6</sup> For example, Thomas Kuhn's 'account of science is not one that makes sense to a scientist', *Beyond Science: the Wider Human Context* (Cambridge: Cambridge University Press, 1998), p. 12.
- <sup>7</sup> *Scientists as Theologians*, p. 3. By 'verisimilitude' JP means 'mapping within the limits of a scale', *Beyond Science*, p. 14. Historically, science succeeded quite simply because 'it really did represent aspects of the way things are', *Quarks, Chaos and Christianity*, p. 7. 'Any other account would make sustained instrumental success a mysterious miracle', *Serious Talk*, p. 36.
- <sup>8</sup> 'At the heart of scientific realism lies the conviction that intelligibility is the reliable guide to ontology, that concepts and entities whose postulation enables us to make deep sense of wide swathes of experience, are to be taken with the utmost seriousness as candidate descriptions of what is actually the case', *Belief in God in an Age of Science* (New Haven, CT: Yale University Press, 1998), pp. 109-10.
- <sup>9</sup> 'Reflections of a Bottom-up Thinker' in Watts & Knight, *God and the Scientist*, p. 2. JP is also indebted to Polanyi more specifically on the questions of tacit knowledge and the unformalizable role of skill and personal judgement in scientific discovery, *Belief in God in an Age of Science*, p. 106. It is interesting, however, that, despite his accompanying interest in divine agency, he seems not to make use of a congenial relevant formulation on the 'stratified structure of comprehensive entities' in Polanyi's *Knowing and Being*: see, e.g., Owen Thomas, 'Recent Thought on Divine Agency' in Brian Hebblethwaite and Edward Henderson, *Divine Action: Studies Inspired by the Philosophical Theology of Austin Farrer* (Edinburgh: T & T Clark, 1990), p. 45. Alister McGrath draws attention to the importance of the same point in Polanyi's *The Tacit Dimension in A Scientific Theology: volume 2, Reality* (Grand Rapids, MI/Cambridge, UK: Eerdmans, 2002), p. 209.

is and, doing commerce in what is not directly observable, it also eschews naïve objectivity.<sup>10</sup>

So what is the world like? For JP, that is the same question as: what is creation like? It is a basic question; *One World* was preceded by *The Way the World Is*.<sup>11</sup> In answering the question, it goes without saying that JP operates with the standard scientific picture of a world that evolved out of a cosmic big bang.<sup>12</sup> The twentieth century witnessed a big shift from the mechanistic world of the eighteenth century to our open world; first, quantum and then chaos theory effected that.<sup>13</sup> The complex dynamic systems which underlie chaos theory are the most striking of all features making for an open world. They characterise a cosmic order and openness correspondingly conceptualized in terms of necessity and of chance, i.e., of its lawful regularity and historical contingency.<sup>14</sup>

In this context, JP develops an account of causality. Along with the staple 'bottom-up' causality which is the fare of physicists, where energy inputs are discerned by tracking the behaviour of the physical parts, JP emphasises a 'top-down' causality consisting of inputs of 'pattern-formation' which we cannot track in the same discrete behavioural elemental terms but which we can rationally posit in an account of the overall behaviour of the whole. This latter input is 'information' and it is not energetic.<sup>15</sup> Dynamic development can yield one rather than another cosmic 'structure of [...] future history' without the difference being specifiable

<sup>10</sup> See the first two chapters of *Scientists as Theologians*. For a good statement of what critical realism is, see *Belief in God in an Age of Science*, chapter 5.

<sup>11</sup> *The Way the World Is* (London: Triangle, 1983).

<sup>12</sup> For his summary of the standard picture up till the emergence of cosmic self-awareness through to the modern form of *homo sapiens* around 40,000 years ago, see *Science and Christian Belief*, pp. 71-73. However, we must not be misled into thinking that JP accepts 'the total adequacy of a neo-Darwinian account of evolutionary history': it has neither accounted for the relation of its findings to the time-scale with which it works nor explained how increasing complexity actually works, especially in relation to the evolution of the hominid brain, *Science and Christian Belief*, pp. 16-17. For the insufficiency of a Darwinian evolutionary explanation in relation to quantum theory, see Polkinghorne, *Quantum Physics and Theology: an unexpected kinship* (New Haven: Yale University Press, 2007), pp. 7-8.

<sup>13</sup> Of quantum theory, JP says: 'At the level of explanation and prediction it is, perhaps, the most successful scientific theory ever. Yet', he adds, 'we do not understand it', *Faith, Science and Understanding* (London: SPCK, 2000), p. 6.

<sup>14</sup> See, e.g., *Faith, Science and Understanding*, p. 6. This is integrated into a theological account in chapter 6.

<sup>15</sup> See, e.g., *Reason and Reality* (London: SPCK, 1991), chapter 3.

in terms of energy.<sup>16</sup> So there is a 'bottom-down' operation of the whole, a pattern-formation decisively constitutive of that whole which is the product of active informational non-energetic input. 'By information is meant something like the appropriate specification of dynamical patterns of ordered behaviour'.<sup>17</sup> 'Something like' is not a lapse into vagueness; scientists are still en route to understanding information and understanding it as the stuff of the universe, at least as basic as matter and energy.<sup>18</sup> Of course, energetic and informational causalities operate concurrently. Informational causality can be succinctly described as a 'holistic form [...] that organizes the world's patterns of behaviour at the structural level'.<sup>19</sup> The big picture is that chaotic systems are sensitive to the very slightest conditional change and this massively affects the future.<sup>20</sup> Here we encounter openness, 'gaps' in the universe, not the epistemic gaps which

<sup>16</sup> *Belief in God in an Age of Science*, p. 62. More precisely, we witness only 'vanishingly small' energetic differences; see Nicholas Saunders, 'Polkinghorne on Mathematics and Chaos Theory' in Watts & Knight, *God and the Scientist*, p. 64.

<sup>17</sup> *Exploring Reality* (London: SPCK, 2005), p. 31.

<sup>18</sup> JP observes that it is 'beyond my power to specify with precision' how information is related to dynamic structure, *Belief in God in an Age of Science*, p. 50, n. 2. But he is 'bold enough to conjecture that by the end of the twenty-first century, an appropriately formulated concept of information will have taken its place alongside energy as a fundamental category in science', *Theology in the Context of Science* (London: SPCK, 2008), p. 78. He is a strong opponent of reductionism and the belief that the sub-atomic world is the basis of scientific explanation in physics. To get at JP's reasoning, we should need to delve into an area which we must unfortunately neglect, namely, his understanding of personhood. To take a simple example, he understands the intentional action of raising an arm as an action of the whole individual exercising a top-down causality irreducible to sub-atomic explanation, *Science and Theology: an Introduction* (London: SPCK, 1998), p. 88.

<sup>19</sup> With Terry J. Wright, 'Is Informational Causality Primary Causality? A Study of an Aspect of John Polkinghorne's Account of Divine Action' in Watts & Knight, *God and the Scientist*, p. 34. Note what JP says of quantum events, namely, that '[s]ubatomic events scarcely look like promising locations for holistic causality [...]. If quantum theory does have a role to play in solving the problem of agency, it will only be because its effects are amplified in some way to produce an openness at the level of classical physics', *Belief in God in an Age of Science*, p. 60. Cosmic openness is the function of chaos and not of quantum.

<sup>20</sup> Although the investigation of chaos may be defined – e.g., as 'the qualitative study of unstable aperiodic behaviour in deterministic non-linear systems' (Kellert) – it does not follow that chaos *theory* can be dogmatic on what constitutes mathematical chaos. So Saunders, 'Polkinghorne on Mathematics' in

wrongly led to past talk of the 'God of the gaps' but ontic gaps which describe cosmic openness.<sup>21</sup> We shall later see how JP takes this up into a theological account of divine causal action.

So much for the world; what of theology? JP espouses a natural theology, an account of which, including the significance of moral and aesthetic experience, would take us too far out of our way, but we should note his conviction that the world as scientifically described points to a Creator.<sup>22</sup> JP marvels at a world whose accessibility to our understanding goes far beyond our evolutionary need to survive and adapt.<sup>23</sup> Not only is the world intelligible, it is mathematically beautiful and mathematics is 'unreasonably effective' (Eugene Wigner) in describing it; how can the free creation of the human mind, which mathematics seems to be, prove so 'finely tuned to the structure of the universe'?<sup>24</sup> Exploring the

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Watts & Knight, *God and the Scientist*, p. 53, n. 8. I shall later note the significance of mathematics for JP.

<sup>21</sup> 'One god who is well and truly dead is the god of the gaps', *Traffic in Truth: Exchanges Between Science and Theology* (Norwich: Canterbury Press, 2000), p. 29. If gap language is used positively, it must be in a different way: 'In this *intrinsic* sense, we are quite properly "people of the gaps" and God is quite properly a God of that kind of gap also', *Serious Talk*, p. 86. I apostrophise at this juncture to say that JP has a tendentious understanding of the God of the gaps as one who is related just to 'the bits that are hard to understand' in creation and not to the whole of it', *Traffic in Truth*, p. 30. He says this more than once: see *Quarks, Chaos and Christianity*, p. 22. He does not meet the objection that the historical 'God of the gaps' is ontically related to the whole of creation but invoked as an *explanation* for what is scientifically inexplicable – wider ontological denial is not entailed in narrower epistemological appeal. It is also noteworthy that – rightly or wrongly – Arthur Peacocke believed that Polkinghorne's account of indeterministic systems constituted a gap for God, cited in James M. Watkins, 'John Polkinghorne's Kenotic Theology of Creation and its Implications for a Theory of Human Creativity' in Watts & Knight, *God and the Scientist*, p. 230.

<sup>22</sup> I also ignore JP's axiological argument for the existence of God, *Belief in God in an Age of Science*, p. 20.

<sup>23</sup> With reference to our knowledge of the quantum world, JP remarks: 'I cannot believe that our ability to understand its strange character is a curious spin-off from our ancestors having had to dodge saber-toothed tigers', *Beyond Science*, p. 79.

<sup>24</sup> *Beyond Science*, p. 80. '[T]ime and time again, the search for beautiful equations has proved the key to fruitful advance in fundamental physics [...]. This profound human ability to understand the world [...] goes far beyond any evolved capacity needed in the struggle for survival', *Scientists as Theologians*, p. 52.

metaphysical implications of physics leads us to the key player in natural theology – the Anthropic Principle. The fine-tuning of the world so that carbon-based and eventually human life can emerge from its fabric is surely best (by far) explained if we posit a Creator.<sup>25</sup> It is an argument from design but, JP claims, not of the old kind which worked from the superficial appearance of outward design to the conclusion that there is a Designer. JP's argument works strictly from the physics, chemistry and biology of the universe as disclosed by a rigorous scientific account, complementing and not rivalling such an account.<sup>26</sup> His is a 'revived and revised natural theology'.<sup>27</sup>

Does JP think that a natural theology arising from a scientific account of the world should exercise any constraint on the Christian understanding of creation? Well, he would doubtless say that anything which is known, whether through science or any other avenue, self-evidently constrains what we may rightfully say about anything else.<sup>28</sup> For example, if science definitively discloses a heliocentric world, this quite rightly exercises a constraint on Christian doctrine. For JP, natural theology is part of theology, integrated into the rest of theology in a single endeavour

<sup>25</sup> *Serious Talk*, pp. 68-72. JP constantly reiterates this point, making distinctions between types of Anthropic Principle, e.g., in *Reason and Reality*, chapter 6. See *Scientists as Theologians*, p. 52 on the moderate Anthropic Principle. As far as JP is concerned, the alternative explanation – that there are millions of other universes so that the probability of the existence of one as fine-tuned as ours is increased – altogether lacks scientific evidence in its support.

<sup>26</sup> 'This new natural theology differs from the old-style natural theology of Anselm and Aquinas by refraining from talking about "proofs" of God's existence and [...] from the old-style natural theology of William Paley [...] by basing its argument not upon particular occurrences (the coming-to-be of the eye or life itself) but on the character of the physical fabric of the world, which is the necessary ground for the possibility of any occurrence', *Belief in God in an Age of Science*, p. 10. His reading of the history of natural theology has been challenged: see Russell Re Manning, 'On Revising Natural Theology: John Polkinghorne and the False Modesty of Liberal Theology' in Watts & Knight, *God and the Scientist*, pp. 210-11. In conjunction with this, see Del Ratzsch, *Science and its Limits: the Natural Sciences in Christian Perspective* (Downers Grove, IL/Leicester, UK: IVP, 2000), pp. 126-28. It is interesting to notice that JP is not strongly opposed to Intelligent Design, *Faith, Science and Understanding*, p. 77.

<sup>27</sup> *Scientists as Theologians*, p. 52.

<sup>28</sup> Nothing which is known can be validly contradicted because, if the putative contradiction stands, then what was originally taken to be known was not actually known.



to understand God.<sup>29</sup> To the extent that this constitutes scientific ‘constraint’, JP certainly does not wish it to be understood as imperialism, domination or control:

Science cannot tell theology how to answer theological questions, and theology cannot tell science how to answer scientific questions [...]. Science will tell theology what the structure and the history of the physical world are like. Theology will gratefully acknowledge these gifts and seek to set them within the more profound and comprehensive setting that belief in God affords.<sup>30</sup>

Where moves towards a theological understanding are made on the basis of science, JP introduces convergent moves on the basis of Christian doctrine in order to attain a unified and consistent conclusion.<sup>31</sup> Perhaps the most significant consonance in relation to creation emerges when we observe the combination of order and openness in the world disclosed by science. Order bespeaks a God of order, of rationality and of fidelity to that order and this is the creational expression of his internal rationality. Openness bespeaks a God who does not determine all things. JP takes the relevant theological propositions to be capable of being theologically established and not foisted unilaterally on theology by science.

## CREATOR AND CREATION

So we arrive at JP’s theology of creation and the trilogy.<sup>32</sup> Creation comes up for sustained, if summary, discussion in *One World* under the rubric of ‘Possible Conflicts’ between science and theology (pp. 65-77). Conflict turns out to be needless in relation to cosmic origins: divine causality and physical causality operate on different and compatible levels, divine creation being ‘properly understood as a continuing act of God’s will which maintains the cosmos moment by moment. It is not just about some initiating instant’ (p. 66). In so maintaining it, God, as ‘a patient and subtle Creator’ effectively works out his purposes through the nexus of chance

<sup>29</sup> *Science and Christian Belief*, p. 43.

<sup>30</sup> *Traffic in Truth*, pp. 10-11. Science can, ‘to a minor degree, constrain the form of some of the answers that can be proposed’ by theology, *Science and the Trinity: the Christian Encounter with Reality* (New Haven, CT: Yale University Press, 2004), p. 5.

<sup>31</sup> If we are entertaining the vocabulary of constraint, there is two-way traffic: the first consequence of the way in which Christians (and other theists) think about creation ‘is that we expect the world to be orderly, because its Creator is rational and consistent’, *Quarks, Chaos and Christianity*, p. 18.

<sup>32</sup> From now on, page references to the trilogy will usually appear in the text.

and necessity, contingency and potentiality' (p. 69). Conflict also turns out to be needless in relation to divine interaction with the world and at this juncture JP introduces a concept, albeit tentatively, which will be key in his subsequent literature: the concept of kenosis. God is love and this means that his interaction with the world will inevitably follow the way of love. Such 'may well involve the acceptance by its author of some measure of limitation, a kenosis [...] of divine power' (p. 71). God does not determine; he interacts with the world.

The tentative 'may' in the description above is transmuted into something more definite in *Science and Creation*, a single-volume gift of a work to the lazy expositor tasked with expounding JP on creation, for its main lines are adumbrated and supplemented rather than fundamentally altered in the subsequent literature. At least this is so for the most part. There is one significant shift in JP's thinking. In a second edition, published eighteen years later, JP acknowledged that he had changed his mind on one aspect of divine causal activity. In the first edition, divine action is not one cause amongst many worldly causes, for it features causality of a different order. By the time of the second edition, the author 'had come to believe that God may choose to act as a providential cause within the open grain of nature', a 'gracious decision to act in this way [...] being part of the divine kenosis in creation'.<sup>33</sup> That is, divine causal activity can take mundane as well as a divinely unique form. We shall shortly see that with the word 'kenosis' we arrive at something fundamental in JP's thought on creation.

In *Science and Creation*, after advancing the cause of natural theology and the need for metaphysics which physics signals, JP offers a relatively technical account of key features of the physical world laid bare by modern science – its generic becoming and the particularity of its evolutionary course; its embodiment of the interplay of chance and necessity, symmetry and spontaneity. What theological account of the cosmos and its Creator is consonant with this? JP reiterates his belief that the doctrine of creation should not be 'conceived of as a doctrine of temporal origin', a mistake not uncommon in the history of Christian thought (p. 54). God's sustaining of the cosmos 'by a continuous act of will' is creative activity in a full-orbed sense. Key for JP is the thought of God creating by 'letting-

<sup>33</sup> *Science and Creation* (Conshohocken, PA: Templeton, 2006), p. xii. The distance which JP has travelled here is indicated by the remark in the first edition that the God conceived of as Creator in his (JP's) terms is removed '*as far as possible* from any idea of a demiurge. The latter is a cause among causes' (p. 55). Italics are mine. It should go without saying that JP does not think that the God of the first edition has *in toto* transformed into the demiurge of the second.

be', not in the mode of deistic absence but in a much subtler and complex way. However, not only must the traditional understanding of creation be re-envisioned in order to make space for continuous letting-be; something metaphysically richer is in order. Enter Moltmann. Moltmann rejects any belief that *creatio ex nihilo* is creation either out of the divine being or out of pre-existent matter. Rather, '[i]t is only God's withdrawal into himself which gives that *nihil* [as in *ex nihilo*] the space in which God becomes creatively active.'<sup>34</sup> The creation which is outside God, according to Moltmann, 'exists simultaneously *in God*, in the space which God has made for it in his omnipresence [...]. Has God not therefore created the world 'in himself', giving it time in his eternity, finitude *in* his infinity, space *in* his omnipresence and freedom *in* his selfless love?'

'Moltmann is the contemporary theologian who has been the greatest influence on me in my own theological thinking.'<sup>35</sup> When it comes specifically to the doctrine of creation, two of Moltmann's works command JP's attention: *The Trinity and the Kingdom of God* and *God in Creation*.<sup>36</sup> The discussion in *The Trinity* which is of interest to JP and which Moltmann develops in *God in Creation* sets out Moltmann's unease with the traditional notion of God creating *ex nihilo* as an act of sheer will, in a form constrained by his nature but not out of a nature constrained to create.<sup>37</sup> On a traditional understanding, God is contingently a creator in the sense that he might not have created, but he is not eternally creative. He is not essentially self-communicating love except within the self-enclosed Trinity. Supposedly, he creates 'outwards', but herein lies the problem. What can 'outwards' be for God? If there is an 'outside' vis-à-vis God, 'then we must assume [...] an equally eternal non-divine or counter-divine entity, which would be "outside". But would this not be to contradict God's divinity, which means his omnipresence?'<sup>38</sup> Moltmann proposes that in order for God to create, he must limit himself, making space within himself by self-limiting withdrawal. There are thus two movements: first, the letting-be of space by withdrawal and then creation *ex nihilo* in that space (the

<sup>34</sup> The citations from Moltmann are found on p. 61 of *Science and Creation*.

<sup>35</sup> 'Some Responses' in Watts & Knight, *God and the Scientist*, p. 270. Consistently rejecting both panentheism and process thought (e.g. *Science and Christian Belief*, pp. 64-68), JP finds in Moltmann's thought an acceptable alternative to traditional theistic orthodoxy.

<sup>36</sup> Moltmann, *The Trinity and the Kingdom of God: the doctrine of God* (London: SCM, 1981) and *God in Creation: an ecological doctrine of creation* (London: SCM, 1985).

<sup>37</sup> See *Trinity*, pp. 105-14 and *God in Creation*, chapter 4.

<sup>38</sup> *Trinity*, p. 109.

*nihil*).<sup>39</sup> Christian theology has barely considered this option historically – '[N]o one has even asked the critical question: can the omnipotent God have an 'outward' aspect at all?<sup>40</sup> – but the Jewish kabbalistic tradition explored it particularly via Isaac Luria's notion of *zimsum*, a concentrated contraction and withdrawing of oneself into oneself, God into himself.

Why does JP (whose references to Moltmann on this point are not confined to *Science and Creation*) support this notion? As far as he is concerned, the traditional characterization of the God who created *ex nihilo*, as one who willed freely and in accordance with his nature, is correct in its general formulation as far it goes. But the traditional understanding of divine self-sufficiency which accompanies it neglects the nature of God as the generous outflow of love and Moltmann correctly sees that.<sup>41</sup> Love bestows freedom. Creative love involves, though involves more than, an ongoing gift of freedom embedded in a *creatio continua*. In relation to the world's emergence, we have 'the difficult but essential task of trying to preserve both the independence of creation and its Creator's involvement with it' (*Science and Creation*, p. 62) and this is where Moltmann, with his reference to the *zimsum*, attracts JP's commendation.

Moltmann is not alone in attracting it. He is joined in *Science and Creation* by a second influential figure, W. H. Vanstone.<sup>42</sup> Vanstone is no less influential than is Moltmann on this point in particular, but their influences are a bit different, if neatly convergent. Whereas they are both influential in relation to kenosis, Moltmann's influence is that of the theologian, Vanstone's that of the pastor.<sup>43</sup> Vanstone is appreciated and saluted for his insight into the nature of love, even if he can be 'excessive' (p. 62). In

<sup>39</sup> The space created by divine withdrawal is not a vacuum: it is 'God-structured', Moltmann, *The Coming of God: Christian Eschatology* (London: SCM, 1996), p. 299.

<sup>40</sup> *God in Creation*, p. 86.

<sup>41</sup> Alan Torrance, who notes the appropriate conceptual distinctions in Moltmann, for whom 'the predicate *ex nihilo* serves to emphasise the ultimate and unconditional nature of the divine love', rightly characterises creation here as an 'ecstatic act of divine communion', '*Creatio Ex Nihilo* and the Spatio-Temporal Dimensions with Special Reference to Jürgen Moltmann and D. C. Williams', in Colin E. Gunton, ed., *The Doctrine of Creation: Essays in Dogmatics, History and Philosophy* (London, UK/New York, NY: T&T Clark, 1997), pp. 83-104, quotations from pp. 84-85.

<sup>42</sup> Only one work by Vanstone features here, *Love's Endeavour, Love's Expense: The Response of Being to the Love of God* (London: Darton, Longman & Todd, 1977).

<sup>43</sup> So in the Gifford Lectures, *Science and Christian Belief*, Moltmann is prominent and Vanstone barely present.

a volume where he compares his own thought with that of other scientist-theologians (Ian Barbour and Arthur Peacocke) JP points out that '[w]e all refer to the writing of W. H. Vanstone', remarking that '[a]lthough his thought is motivated by a profound meditation on the nature of creation by love and it shows no sign of an engagement with modern science, it has led him to give what is a perfect insight into the nature of an evolutionary universe'.<sup>44</sup>

It is useful if we briefly turn to Vanstone himself. Vanstone stipulated 'three marks or signs' which deny 'the authenticity of love'.<sup>45</sup> The first is limitation; the second is control; the third is detachment. 'From these we may approximate to a description of authentic love as limitless, as precarious and as vulnerable'.<sup>46</sup> From an agentic point of view, utter self-expenditure, willingness to accept the utter precariousness of love's outcome and utter lack of self-sufficiency are the order of the lover's day. If ideal human love is like that, divine love cannot possibly be different without doing violence to our use of the word 'love'.<sup>47</sup>

Hence a chapter in Vanstone's work titled, 'The Kenosis of God'. Prescinding somewhat, it would seem, from his account of the phenomenology of love, Vanstone avers as a matter of theological principle that 'when Christian devotion contemplates the Redeemer, it attributes to his "labour" a limitlessness, a vulnerability and a precariousness which mark it as the labour of authentic love' and, this being so, the Creator must also be so characterized.<sup>48</sup> This is the principle which governs Vanstone's account in this chapter. The self-sufficient, controlling God who guaran-

<sup>44</sup> *Scientists as Theologians*, p. 46. JP also avers here that the three scientist-theologians all believe also in divine self-limitation or kenosis (p. 45). He is being gentle in his reference to Vanstone and modern science; in the chapter of *Love's Endeavour* where he does talk about science (chapter 5), Vanstone takes as modern a scientific world-view which JP throughout his work shows to be outdated and wrong.

<sup>45</sup> *Love's Endeavour*, p. 42.

<sup>46</sup> *Love's Endeavour*, p. 53. 'It is perhaps proper that our approximation should contain a degree of mistiness and imprecision: for we are describing not that which any man has known or experienced but that towards which every man, at the depth of his being which is more profound than language, gropes and aspires' (pp. 53-54).

<sup>47</sup> 'If we can describe the form of authentic love, we can hardly look elsewhere for a description of the love of God. If we can say "what love ought to be", we need enquire no further what the love of God is. Any further question would be profitless and even meaningless enquiry into "an unknown something", *Love's Endeavour*, p. 39.

<sup>48</sup> *Love's Endeavour*, pp. 58-59.

tees outcomes is out of the question. JP is impressed by the main line of this reasoning.<sup>49</sup> The world is one of being, order and necessity but also of becoming, disorder and chance. This is our world of evolutionary process. 'Without chance there would be no change and development; without necessity there would be no preservation and selection. They are the yin and yang of evolution.'<sup>50</sup> Chance most certainly does not do away with Christian belief.<sup>51</sup> It is itself embraced within God's purposes, but it is not the product of divine control. '[T]he role of chance in the world's process is a reflection of the precariousness inescapable in the gift of freedom by love' (*Science and Creation*, p. xiii). This is what Vanstone so strikingly captures, without the science. Luria's *zimsum* is Vanstone's *kenosis*.<sup>52</sup>

I have given Moltmann and Vanstone expository space because they are important co-contributors to JP's fundamental theological understanding of creation.<sup>53</sup> In *The Work of Love*, a collection edited by JP, they

<sup>49</sup> JP uses the word 'excessive' (see above) without comment, but a comparison of his thought on creation with that of Vanstone yields at least two points of disagreement. The first is that JP believes, as Vanstone does not, that theodicy requires the conviction that God necessarily brings out of evil a greater good (see *Love's Endeavour*, p. 65). The second, and more prominent, is that JP believes that the ultimate eschatological triumph of God, albeit not achieved via a determinate programme, is an article of faith. Vanstone, in a way which is arguably consistent with his governing theological principles, says that '[t]here is given to the creation the power to determine the love of God as either triumphant or tragic love', *Love's Endeavour*, p. 67. This is also a christological (staurocentric) principle (p. 70).

<sup>50</sup> *One World*, p. 51.

<sup>51</sup> JP calls it 'tame chance' because it functions within a lawfully regular environment, *Science and Providence*, p. 30.

<sup>52</sup> 'Creation as kenosis' is a loose, though perhaps not hopelessly loose, family of ideas rather than a uniform point of view. For the variety amongst panentheistic thinkers alone, see Watkins, 'John Polkinghorne's Kenotic Theology' in Watts & Knight, *God and the Scientist*, p. 222, n. 15. From a different theological vantage-point, we may also mention Emil Brunner, whom Moltmann cites in this connection in *Trinity*, p. 237, n. 23 and *God in Creation*, p. 87. JP attributes to T. F. Torrance a kenotic view of creation in *Faith, Science and Understanding*, p. 180.

<sup>53</sup> Before taking our leave of Vanstone, I note that he rather unexpectedly qualifies his account of God by emphasising the danger of excessive anthropomorphism, applying this to talk of divine vulnerability and describing a 'self-emptying of Him Who is already in every way fulfilled', *Love's Endeavour*, p. 69. Speaking generally, he holds that 'between that which is properly predicated of God and that which is improperly predicated we cannot draw the line with any confidence' (p. 67).

are picked out as the inspiration for the essays gathered together there.<sup>54</sup> JP's essay on 'Kenotic Creation and Divine Action' in this collection is an important one. When, in the preface to the second edition of *Science and Creation*, JP alluded to the modification of his position on divine causality, it is to this essay that he referred. Its importance for understanding JP on creation lies in its integration of divine kenosis into his thinking about divine causality (or *vice versa*).

For some time before *The Work of Love*, JP had explored a theological account of the scientific phenomenon of top-down causality. 'The notion of such top-down causality seems to offer an attractive possible analogy to the way in which God could interact with creatures'.<sup>55</sup> Reminding us in his essay in *The Work of Love* that a scientific account of the nature of informational causality generates metaphysical questions, he envisions the possibility of a theological account incorporating the science and encompassing 'our human experience of willed action and our religious intuitions of God's providential care'.<sup>56</sup> An account of special providence (particular divine action in the process of creation as opposed to the general providence which is the divine sustenance of cosmic order) might be metaphysically parsed in terms of 'God acting through *pure* information input' in contrast to creatures, whose acts 'involve a mixture of energetic and informational causalities' on account of their embodiment (p. 101). 'Active information might prove to be the scientific equivalent of the immanent working of the Spirit on the 'inside' of creation.'<sup>57</sup> This is preferable to trying to discern divine action at quantum level.<sup>58</sup> On this (active information) scenario, God is not a cause amongst causes, not a *dramatis persona* but an improvisatory director.<sup>59</sup>

<sup>54</sup> Polkinghorne, ed., *The Work of Love: creation as kenosis* (Grand Rapids, MI/Cambridge, UK: Eerdmans, 2001), p. x. Moltmann is himself one of the essayists in this collection.

<sup>55</sup> *Belief in God in an Age of Science*, p. 58.

<sup>56</sup> 'Kenotic Creation and Divine Action', p. 100. As this is a fairly brief essay (pp. 90-106), I shall not cite the particular page references to my citations from this essay.

<sup>57</sup> *Science and Theology*, p. 89. JP is tentative: see both *Belief in God in an Age of Science*, p. 72 and *Faith, Science and Understanding*, p. 141. Furthermore, see 'Some Responses' in Watts & Knight, *God and the Scientist*, p. 272.

<sup>58</sup> *Faith, Science and Understanding*, p. 120.

<sup>59</sup> Terry Wright observes that '[o]n this account, God seems to act not so much by *causing* things to happen, but by influencing the context *within which*, or the conditions *under which*, things happen', 'Is Informational Causality Primary Causality?' in Watts & Knight, *God and the Scientist*, p. 34. Although Wright may be correct in identifying an element of unclarity in JP's account,

But does this do full justice to divine kenosis? It is the realisation that it does not which now prompts JP to re-examine the distinctiveness of divine causality as proposed in his previous accounts and, while retaining that belief in this essay, to modify it by identifying a supplementary mode of divine causality, one which *does* operate as do material causes. In so acting, God is kenotically condescending to our estate.

Accordingly, JP now identifies four forms of divine kenosis. First, there is the kenosis of omnipotence: God allows evolutionary history to make itself. Second, there is the kenosis of 'simple eternity': in bringing forth creation, God 'added', as it were, a temporal pole to his deity in order to interact kenotically with creation.<sup>60</sup> Thirdly, there is the kenosis of omniscience: 'The future does not yet exist and this leads to the belief that even God does not yet know it'. Fourthly, there is the form which expresses JP's new move: there is the 'kenosis of causal status'. Divine special providence may now act as a cause among causes. The incarnation, which generates kenotic language in the first place, dramatically reveals the God who becomes a cause among causes. It is not that divine governance of the universe is set aside or jeopardized in incarnation; it is that incarnation tells us something about the form of divine governance. It suggests that to ascribe to God creative governance in the form of primary causality exercised by total control is mistaken; there is not total control and at least one form of divine causality is a creaturely form. The Spirit acts kenotically as did the Son in incarnation. A sound scientific account of 'intrinsic' cosmic 'unpredictabilities' opens the space for us to talk of the 'interweaving of providential and creaturely causalities'. Thus 'kenotic providential causality is also exercised energetically as well as informationally'; the identification of the working of the Spirit with pure information input is no longer simply an alternative to energetic causality.

I have alluded to this essay in order to extend my report on the crucial chapter in *Science and Creation* on 'Creation and Creator'. Moltmann

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his own description is unclear also. Presumably he means 'not so much...but more by' rather than 'not by...but by' (italics are mine in the construction of each of my two alternative formulations). But the 'not so much' is metaphysically unclear. And the academically peevish will also ask whether he means 'either context or condition', 'both context and condition' or that 'context' and 'condition' can be used interchangeably. (I suspect the last.)

<sup>60</sup> 'Pole' is the language of process thought and Polkinghorne has sometimes been regarded as a process theologian (*Science and Christian Belief*, p. 65) although he has consistently repudiated process (along with pantheist) thought. One of his criticisms is that it regards the temporal/eternal polarity 'as a metaphysical necessity rather than a kenotic acceptance on the Creator's part of participation in temporality', *Exploring Reality*, p. 119, fn. 3.



helps JP out again in the chapter immediately following. Turning to 'The Nature of Reality' and enquiring what a unified theological and scientific account looks like, JP concentrates on the dual character of our world, comprising both material and mental phenomena. In his chapter on 'Levels of Description' in *One World*, after alluding to the hierarchy of knowledge we obtain when we indicate physics, chemistry, biochemistry, biology, psychology, sociology and theology, JP observed that '[t]he most important and perplexing problem in this general area of level relationships is the perpetual puzzle of the connection of mind and brain' (p. 92). He briefly remarks on it there but now takes it up further in *Science and Creation*. His conclusion is that we have 'a complementary world of mind/matter in which these polar opposites cohere as contrasting aspects of the world-stuff, encountered in greater or lesser states of organization' (p. 71).<sup>61</sup> 'Complementarity' in this context takes the form of contrasting accounts of the same phenomenon. The question of complementary modes of description came up in physics dramatically and famously in the case of light waves and particles which, in quantum theory, yielded an account of them as complementary actualities constituting a single reality. We can abstract from this a set of reflections on complementarity and JP holds that you can move beyond the complementarity internal to physics to the notion of the complementarity which obtains in the relation of physics to metaphysics.<sup>62</sup>

Such is the contrast between mind and matter which is embraced in dual-aspect monism that it allows us to speak of a 'noetic world'. '[W]e have good reason for supposing that there are inhabitants of the mental world which are not anchored in the material' (p. 75). There are truths of mathematics.<sup>63</sup> There might be angels. Parapsychological phenomena might inhabit such a world. All this is an attempt

<sup>61</sup> Interestingly, JP does not absolutely rule out dualism (*Exploring Reality*, p. 46). To understand why, we should need to elaborate on JP's view of the resurrection of the body although this is not to imply that his view is dualist. JP finds Aquinas' view of the soul as the form of the body akin to his own, *Exploring Reality*, p. 47.

<sup>62</sup> JP notes that Barbour opts for understanding complementarity solely as an inner-disciplinary concept, *Reason and Reality*, p. 26. JP treats it in that restricted way in his early *The Way the World Is*, pp. 23-25.

<sup>63</sup> 'If there is a dualism in P's thought [...] it is perhaps a dualism of mathematics and matter', Fraser Watts, 'Theology and Scientific Cosmology' in Watts & Knight, *God and the Scientist*, p. 141. He adds that '[a]lthough Polkinghorne is no dualist, it would not be difficult for someone to take his emphasis on information, and to develop it in a more dualistic way than he does himself', p. 147. JP himself observes that '[t]he one absolute duality that I believe is theologi-

[...] to do justice to what seems to me to be a fundamental human experience, namely that by our biologically evolved consciousness we participate in a realm of reality which has not come into being either with us or with the origination of the physical world in the big bang, but which has always been there.

Platonism? JP denies it for two reasons. Firstly, he is not proposing a priority of the mental over the material. Secondly, his noetic world 'is not an eternal uncreated world' (p. 77). It is not the ultimate Platonic world of the intelligible; it depends on God. Enter Moltmann with a dose of theological help. Moltmann's help comes from his musings on God as Creator of heaven and earth and the question which he poses at the beginning of the relevant chapter in *God in Creation*, 'Why Is Creation A Dual World?', i.e., a world of heaven and earth.<sup>64</sup> Reflecting on the basis of both biblical linguistic usage and the triune nature of God, Moltmann observed that a 'world which has been created by God, and which continues to be created every moment, is bound to be a world *open to God*.' It has its unity not in itself but in God and '[i]n this sense it is an 'open system'. Then comes a sentence which JP quotes more than once: 'We call the determined side of this system 'earth', the undetermined side 'heaven'.<sup>65</sup> Having earlier considered the biblical phrases, 'heaven', 'the heavens' and 'the heaven of heavens', Moltmann identifies a sense in which 'heaven' can be a 'term for the side of creation that is open to God'.<sup>66</sup> It is a 'kingdom of God's energies', energies which 'know no end' because 'God's potentialities are determined by the creative God himself'.

Admittedly, JP is a little cautious in the way that he describes his position in relation to that of Moltmann.<sup>67</sup> What he says in *Science and*

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cally essential to preserve is that between Creator (disembodied Spirit) and creatures (beings in a world of mind/matter complementarity). I see human psychosomatic unity as realised through information/matter complementarity, without denying the possibility of extremes of pure matter (stones) and pure mind (the truths of mathematics; angels?)', 'Some Responses' in Watts & Knight, *God and the Scientist*, p. 271.

<sup>64</sup> *God in Creation*, p. 158. For what follows, see pp. 158-69 in that volume.

<sup>65</sup> Aside from *Science and Creation*, p. 79, see *Reason and Reality*, p. 42 and *Science and Christian Belief*, p. 80.

<sup>66</sup> '[W]e shall use the word heaven to mean *the openness to God of the world he has created*', *God in Creation*, p. 165. The italics are Moltmann's.

<sup>67</sup> '[W]e can give scientific encouragement to what he is driving at', *Science and Christian Belief*, p. 80, Moltmann's thought being 'innocent [...] of any detailed concern for scientific insight', *Reason and Reality*, p. 42. For the contrast, though not collision, between Moltmann and JP on openness, see Junghyung Kim, 'Christian Hope in Dialogue with Natural Science: JP's Incor-

*Creation* is that '[t]here is clearly some consonance between aspects of the noetic world of which I am speaking and Moltmann's created heaven', for, as Moltmann puts it, divine potentialities and potencies are not 'the potentialities and potencies' of God's 'eternal essence *per se*' but are self-designations precisely in his capacity as Creator. Thus, we may speak of heaven in this context as 'the first world God created so that from there he might form the earth, encompass it, and finally redeem it'.<sup>68</sup> How is this connected with and theologically helpful for JP's noetic world? Firstly, if truths of mathematics indicate a noetic world – one which we *discover*, so there really *is* a noetic realm – Moltmann's account is a salutary reminder that the noetic world is not simply that of the 'Great Mathematician'; aesthetic and moral truth reside there too. Secondly, 'God himself is not to be found in the noetic world' (p. 80). It contains his energies but not his essence. That is, the noetic world is a created world and God is not essentially part of it, but it is pervaded by his energies. Mathematics meets Moltmann: mathematics '[i]n a remarkable way [...] illustrates the openness of that world which Moltmann sees as the characterizing property of created heaven' (p. 82).

All this is said in the penultimate chapter of *Science and Creation*. The final chapter, on 'Theological Science', elaborates the belief that theology and science 'share a comradely concern in the search for truth about the world' (p. 88).

JP's specific brief in *Science and Providence*, the third volume of his trilogy, is to describe how a personal God might interact with the world. The complex systems in the world scientifically disclosed to us behave in extremely subtle ways, characteristically involving 'an infinitesimally balanced sensitivity to circumstance' and entailing 'an almost infinitely multiplying variety of possible behaviours' (p. 28).<sup>69</sup> The flexibility of lawful process allows us to speak of both the purposive and the acquiscent wills of God.<sup>70</sup> The possibility of immanent divine action lies 'in those complexes whose precarious balance makes them unsusceptible to prediction' (p. 32). JP does not believe that immanence rules out what we have customarily thought of as 'transcendent' action, signally through miracle. Miracles are not interferences; '[t]he miraculous is simply the providential in unusual circumstances' (p. 25), a form of divine operation

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poration of Bottom-up Thinking into Eschatology', in Watts & Knight, *God and the Scientist*, p. 172, n. 88.

<sup>68</sup> Moltmann's words are quoted on pp. 79 and 80.

<sup>69</sup> Note JP's corresponding denial: 'I doubt whether God interacts with the world by scrabbling around at its subatomic roots', *Serious Talk*, p. 79.

<sup>70</sup> These are not the only categories: there is also an 'economic' will, *Science and Providence*, p. 30.

in the world which differs from what we ordinarily encounter, and the interpretation of miracles must be integrated into our believing knowledge of God's rationality and faithfulness.<sup>71</sup> If a good and faithful God can work miracles, why is there evil? JP introduces a free-process defence to accompany free-will defences in explanation of evil; God bestows freedom on his creation and not just on his creatures.<sup>72</sup> As in the case of miracle, so in the case of prayer: God interacts rather than intervenes. In a short book (and his books are usually short and never long) JP paints on a broad canvas, with time, incarnation, sacrament and hope all being treated in the context of science and providence, the hope pointing to an aspect of JP's theology of creation which I am (with a thoroughly bad conscience) neglecting, namely, his belief in the *nova creatio*, a creation continuous with the old, a *nova creatio ex vetere*, not *ex nihilo*, yet radically new. Its fullest exploration is in *The God of Hope*. For JP, Christian hope is hope in the teeth of and not in tandem with scientific projections for the future of the cosmos.

## BRIEF QUESTIONS

JP's authorship is a sustained, conscientious attempt to understand as much of Christianity as he can as a scientist-theologian and to set it out in an economical but not an obscurely cryptic fashion in a natural, a systematic and a philosophical theology where doctrine and apologetic are deeply integrated in thought and literature. His approach to theology is

<sup>71</sup> JP brings science to bear here by giving conceptual help in the form of explaining how regime or phase changes alter normal behaviour in the world of matter. He makes this point from early on in his literature up to the later *Quantum Physics and Theology*, pp. 33-34.

<sup>72</sup> See *Science and Providence*, pp. 64-66. Additionally, JP regularly points out in his literature that the universe is a 'package deal': that which allows the universe to be itself for good allows it also to be itself for evil. '[G]enes will mutate and cause cancer and malformation through a process that is also the source of new forms of life [...in] an integrated process in which growth and decay are inextricably interwoven as novelty emerges at the edge of chaos', *Exploring Reality*, pp. 143-44. 'The engine driving biological evolution is genetic mutation and it is inevitable in a universe that is reliable and not capriciously magical, that the same biochemical processes which enable germ cells to produce new forms of life will also allow somatic cells to mutate and become malignant', *Science and the Trinity*, p. 72. Here, 'science's gift offers theology modest help with the greatest theological problem of all – the problem of pain and suffering', *Traffic in Truth*, p. 17.

broadly that of Schleiermacher: theology is reflection on experience.<sup>73</sup> He carries this beyond the dissent which he frequently expresses from a view of revelation or Scripture as involving what he terms the mysterious communication of propositional truth, to the point of often proceeding theologically without attention to the main contours of biblical testimony. His positive use and endorsement of Vanstone illustrate this. Vanstone's account of divine kenosis may, from the point of view of theological method, be adjudged a vast *a priori*, his account of divine love ultimately openly controlled by a general phenomenology of love. Some of us, including the author of this article, will be critical and maintain that where the ascription of love to God is derived from Scripture, we should begin our theological labours by asking what it means there; how it is knit there into sovereignty; how divine will and foreknowledge look there; whether vulnerability and risk emerge there. JP shows no interest in interrogating the biblical witness on this score, choosing rather to proceed by conceptual insistence that love is directly incompatible with divine control, decree, determination or programme and, by deductive reasoning, with divine foreknowledge (which he takes to eliminate freedom). As my remit is neither JP's doctrine of God nor his use of Scripture, I merely note an avenue for exploring his view of creation which here remains unexplored.<sup>74</sup>

In a brief conclusion, it seems more useful to ask whether JP's understanding of creation is affected by scientific constraints on his theology beyond the minimal degree to which I have earlier alluded. JP pretty consistently proposes independent theological grounds for affirming positions consonant with those yielded by science. Even in a case like the traditional notion of an historical fall, whose impossibility is apparently decided for JP by the scientific evidence, it would be hard to argue that he did not also arrive at this conclusion on literary-critical grounds, reading

<sup>73</sup> JP would doubtless wish to qualify this by warning us not to exaggerate the theological novelty in Schleiermacher's approach, *Science and Christian Belief*, p. 129. As I agree with his substantive account of JP on experience, I shall not quarrel with Russell Re Manning's identification of a (methodological) connection with Tillich rather than (though not as opposed to) Schleiermacher; see Re Manning, 'On Revising Natural Theology' in Watts & Knight, *God and the Scientist*, pp. 200-4.

<sup>74</sup> I do not imply that Scripture is relatively unimportant to JP devotionally: see *Searching for Truth: A Scientist Looks at the Bible* (Oxford: Bible Reading Fellowship, 1996), p. 13 and *Science and the Trinity*, pp. 39-42. When it comes to eschatology, JP can give strikingly more attention to Scripture than in his construction of the doctrine of God or, for that matter, creation: see *The God of Hope*.

Genesis 1-3 as myth independently of scientific constraints.<sup>75</sup> It is doubtful if science requires or pushes towards something like the *zimsun* and where science is pretty uniformly pessimistic about the future, whether we are in for the Big Crunch or the Big Freeze, JP is a determined eschatological optimist on purely theological grounds. It looks as though JP has secured significant independence for theology.

Nonetheless, in JP's work science can *de facto* exercise both the kind of substantive pressure on Christian doctrine and a disciplinary pressure on Christian theology which require critical scrutiny. As regards the substantive point, JP frequently argues that since (a) God knows things as they are and (b) things occur in temporal succession then (c) God must know things according to their temporal succession; but he once formulates the consequent need for a revised notion of divine eternal timelessness in these terms: 'One motivation for this move is the discovery that physics' actual knowledge of the character of process can be interpreted as being consistent with the picture of a world of true becoming'.<sup>76</sup> We may judge JP guilty of error in philosophical reasoning in the way he arrives at his conclusion of the form of God's knowledge of temporal events. We may also demur from a theology which involves the categorical denial of foreknowledge on the grounds that there is no future to be known; if there were such a future and God knew it, then, JP holds, God would not be perceiving time as it really is in its indeterminate succession. However, for present purposes, the point I wish to make is just about the pressure exerted by science on theology. The massive instantiation of such pressure in JP's work is his wider emphasis on the scientifically-disclosed openness of the world-process which he judges strongly suited to a denial but strongly unsuited to an affirmation of comprehensive divine control.<sup>77</sup> Both philosophical and theological reasoning will impel some of us to question the logical structure of JP's inferential procedure, grounded in scientific disclosure. Can we really read off a particular modality of divine action, even with significant probability, from the (putative) phe-

<sup>75</sup> JP is opposed to belief in the fall of an original pair, such as is depicted in Genesis 3, not to a suitably honed understanding of the fall as a path wrongly taken by humans in the course of history, *Belief in God in an Age of Science*, pp. 88-89.

<sup>76</sup> *Quantum Physics and Theology*, p. 96. As it stands, we may wonder whether the juxtaposition of 'knowledge' and 'picture' in this formulation constitutes a felicitous expression of JP's point, but in the context it is clear what he is saying.

<sup>77</sup> JP is on to this question early in his literature: see the remarks on Donald Mackay in *One World*, p. 68.

nomenon of cosmic indeterminacy? I ask the question without seeking to foreclose the answer.<sup>78</sup>

As for disciplinary pressure, JP's engagement with Austin Farrer is a particularly good example of his view of what creation requires in the way of theological explanation.<sup>79</sup> From an early stage, JP gave critical attention to Farrer's work, including the claim that the causal joint between the double agency of divine and human action is metaphysically elusive.<sup>80</sup> 'Austin Farrer's account of double agency is so emphatic about the inscrutability of the divine side of it as to provide us with no help.'<sup>81</sup> JP is sympathetic to Arthur Peacocke's criticism that Farrer's 'advocacy of this paradox comes perilously close to the mere assertion of its truth'.<sup>82</sup> Frankly, JP finds Farrer's account 'an unintelligible kind of theological doublespeak', by which he appears to mean that Farrer's affirmation of omnipotent agency working non-coercively and non-competitively through creaturely agencies has the status of being simply a bald, metaphysically inexplicable affirmation.<sup>83</sup>

Whatever merits adhere to his criticisms and even though his use of the word 'sometimes' below may cause us a moment's hesitation in coming to Farrer's defence, JP is surely unjust in his observation that 'sometimes, in his writings' Farrer 'exhibits something of the metaphysician's disdain for the pedestrian details of physics'.<sup>84</sup> Farrer is not refusing science; he is simply discounting its ability to make the kind of confident metaphysical contribution which JP thinks it can make.<sup>85</sup> When Farrer's meticulous

<sup>78</sup> Theological pressure on JP's position here is increased if we side with those who question whether we can move from Heisenbergian uncertainty to cosmic indeterminacy.

<sup>79</sup> Austin Farrer (1904-68) was a wide-ranging Anglican thinker and writer whose principal influence has been in the field of philosophical theology.

<sup>80</sup> At some points, JP appeals appreciatively to the work of Farrer and their judgements concur. The difficulties attending a concise formulation of what double agency is appear in Owen Thomas's statement in 'Recent Thought on Divine Agency': 'What is affirmed in double agency, as I understand it, is that in one event both the divine and creaturely agents are fully active' (p. 46). While subsequent explanation offers a degree of clarification, the question that one is bound to ask remains: what does 'fully' mean? 'God acts in and through the finite agent which also acts in the event' scarcely explains 'fully'.

<sup>81</sup> *Reason and Reality*, pp. 45-46.

<sup>82</sup> *Scientists as Theologians*, p. 31, though JP includes a criticism of Peacocke in this connection.

<sup>83</sup> *Science and Christian Belief*, pp. 81-82.

<sup>84</sup> *Science and Providence*, p. 13.

<sup>85</sup> The deeper issue here is JP's quarrel with the way Farrer and others operate with a distinction between the natural and the supernatural, *One World*,

and detailed treatment of analogy yields agnosticism on the operation of double agency, it is not with the intention or effect of demeaning science or, for that matter, showing a lack of metaphysical ambition. Agnosticism arises of Farrer's conviction that divine agency works so differently from the human that the failure to conceptualise their relationship constitutes a theologically positive affirmation of the distinction of divine nature.<sup>86</sup>

JP would respond that it remains that a lack of explanatory power is the outcome of Farrer's approach; what intellectual progress have we made by positing double agency?<sup>87</sup> But does JP not at this point questionably model his expectation of theological progress on his experience of scientific progress? Farrer says: 'How God works in creating, that is the mystery; not the purposes his working achieves'.<sup>88</sup> He makes the relevant point when attending not initially to creation but in the first instance to grace and freedom.<sup>89</sup> From a religious point of view, Farrer holds that we do not need the metaphysical account whose lack JP laments.<sup>90</sup>

[T]he causal joint [...] between infinite and finite action plays and in the nature of the case can play no part in our concern with God and his will [...]. The causal joint (could there be said to be one) between God's action and ours is of no concern in the activity of religion.<sup>91</sup>

Farrer does what JP shows no sign of interest in doing, i.e., mull over biblical passages in Proverbs or Isaiah, for example, in the context of thinking about divine causality.<sup>92</sup> Farrer would surely substitute 'Polkinghorne' for 'Hartshorne' in the sentence: '[A]nd perhaps if God is to be God he cannot be as intelligible to man as Hartshorne would have him'.<sup>93</sup> Whatever our judgement on the broad attribution of fideism to Farrer, JP misunder-

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p. 89. It is possible to sympathise with his broader objection without agreeing with how JP approaches the question of describing the causal joint.

<sup>86</sup> See particularly Farrer's *Faith and Speculation: an essay in philosophical theology* (Edinburgh: T&T Clark, 1967).

<sup>87</sup> *Science and Providence*, p. 12.

<sup>88</sup> *Faith and Speculation*, p. 110.

<sup>89</sup> 'The traditional problems of Grace and Freewill are simply expressions of the invisibility which covers the 'causal joint' between infinite and finite act', *Faith and Speculation*, p. 172.

<sup>90</sup> See Farrer's whole chapter on grace and free will in chapter 4 of *Faith and Speculation*.

<sup>91</sup> *Faith and Speculation*, pp. 65-66.

<sup>92</sup> *Faith and Speculation*, pp. 61-63, 97-99.

<sup>93</sup> *Faith and Speculation*, p. 140. 'In any settlement of boundary-issues between God and nature, there must be give-and-take; the divine has its own logic and must be allowed its own rights. It is as vital that God should remain



stands its theological meaning badly when he says that if no explanation for a causal joint is given, '[t]his leaves the idea looking like mere fideistic assertion'.<sup>94</sup> If belief in such a joint is well grounded, how can the failure of explanation be judged fideistic more than JP's failure to understand how God can both be three and one is fideistic in a case where he judges his own belief in divine triunity well grounded?<sup>95</sup> Farrer is a fideist in relation to creative causality only if the criteria for fideism are determined by physics.

Despite my criticisms of John Polkinghorne, let me conclude with an appreciation of what I think we might fairly term his integrative ambition, advertised in the title and content of this first work in the trilogy, *One World*, and pursued with relentless and unapologetic (and, in another sense, apologetic) determination since then.<sup>96</sup> As an exemplar of this ambition and of the particular thesis that Christian belief in creation causes science no embarrassment – that, on the contrary, our Christian belief is holistically enriching and even mildly required by scientists – John Polkinghorne surely commands our gratitude.

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God, as that nature should remain nature', p. 151. In fairness to him, JP often acknowledges the limits on our knowledge of God.

<sup>94</sup> *Science and Theology*, p. 86.

<sup>95</sup> JP was able to write a whole volume on *Science and Trinity*.

<sup>96</sup> For JP's mature thinking on taxonomies, see the first chapter of *Science and the Trinity*.