

Creation and the philosophy of science: Freedom, contingency and the modality of the natural sciences

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Abstract

Understanding creation through the theological loci of Christology and Trinitarian theology gives a view of the natural world as both contingent and free. This distinctively Christian view of the natural world carries implications for the natural sciences in terms of philosophical modality. This paper explores three such themes: (i) the nature of reason; (ii) the character of theories; and (iii) the relationship between discursivity and the logic of reality.

A trinitarian and Christocentric account of creation undergirds both the absolute freedom of God and the contingent freedom of creation. Understanding the natural world in relation to God's triunity and the person of Jesus Christ provides us with the fundamental *grammar* by which we can speak of the world around us as in possession of its own distinct reality and intelligible order. Crucially, the natural world's distinct reality and intelligibility are not derived from within itself in the fashion of some internal determinism. Instead, both are given to creation from beyond itself by God in the act of freely creating something other than himself. The natural world is free and it is contingent (both at the level of

its existence and its being the way it is). For this reason, a distinctively Christian theological account of the natural world carries implications for the natural sciences in terms of the philosophical modality employed in scientific discovery. This paper elucidates three main areas in which this is so: (i) the nature of reason; (ii) the character of theories; and (iii) the relation of discursive reason to the ontic order of reality through the disturbance of sensibility.

Within the science and religion dialogue, this is not an attempt to give an account of theology that may or may not be acceptable to the natural scientist. Nor is this an exercise in listening to the natural scientist, her theories and methods, understanding the implications these have for theology and attending to the questions they raise. These are worthwhile endeavours but are not what this paper is concerned with. Instead, this paper argues that a theological understanding of the natural universe can be translated through the mediating agent of philosophy such that it makes constructive comments to the philosophy of science concerning contingency. Certainly, if the realist presupposition is allowed that scientific thought is concerned with existent things independent from the human knower and that 'to know' something is for our thought to be determined by that existing thing, then it is of significance to the scientist that creation is contingent.

There have been a wide range of ways in which Christian theologians have set about describing a positive account of the relationship of theology and the natural sciences at the level of modality. For Isaac Newton, absolute space and time, which gave intelligible uniformity to the phenomena at the level of relative space and time by which it might be schematized and understood, was equated to the divine sensorium. As Karl Popper has demonstrated, such an account of coherence at the level of relativity was translated to the knowing mind by the application of the transcendental cognitive power of the human knower upon sensibility by Immanuel Kant.¹ Stanley Jaki held that God has given to creation its own distinct and contingent order by merit of its creation through the *Logos* whereby it is capable of being examined and understood.² For Fr Georges Florovsky, the contingency of creation is of vital importance because it reminds us that creation is not characterized by necessity and so theoretical



systems that exclusively focus on coherence, such logical deduction from *a priori* axioms is, at best, an inappropriate way to gain knowledge of a contingent universe.³ The engagement with the natural sciences, their findings, formation of theories and impact on the way we understand reality was a major concern of Wolfhart Pannenberg. The scope of his theology, with its programmatic theme of revelation as history, means that for Pannenberg the modern chasm between the knowledge of nature and theology must be challenged. As such, the development of a system of theology was accompanied by a parallel engagement with the natural sciences both from their philosophical implications and the questions they raise for the theologian.⁴ For T. F. Torrance, theology has much to learn from the natural sciences about a proper way to coordinate thought with being whereby the theoretical structure by which we cognize something is shaped by the internal coherence of the reality itself.⁵ Likewise, the scientist can learn a spiritual dimension to their task as they operate as the ‘priest of creation’, giving articulation to the coherent order that God has given creation.⁶

The approach taken here inherits much of this recent tradition and looks to integrate it more fully with the programmatic centrality of the core loci of Christian theology: the doctrine of the Trinity and Christology. If the argument of this paper tacks more toward one priority than another, it is toward the perspective of Georges Florovsky that I think the weight of a theological account of the natural world shapes our modality of knowing creation as the natural world. However, the approach taken here is also heavily influenced by T. F. Torrance in his conviction that what we think about creation must take its shape from its relation to God, and that God’s transitive relation to creation is understood in coordination with non-transitive relations of the immanent Trinity.⁷



The triune Creator

The doctrine of the Trinity is the irreducible foundation of an understanding of creation as both *free* (i.e. distinct from God) and *contingent* (i.e. having no internal reason for its being or for its being the way that it is).⁸ The importance of the doctrine of the Trinity in any account

of the relationship of God and creation is well demonstrated by Thomas Aquinas' doctrine of mixed relations. Aquinas' mixed relations arises out from an account of divine perfection and the relation of God to creation conceived of *a priori* in the tight conceptual package of aseity, simplicity and immutability. It is an account of the non-reciprocal relations of God and creation (with creation's relation to God being necessary and God's relation to creation being volitional) which undermines the reality of God's relation to creation. The doctrine of 'mixed relations', in effect, acts as a prophylactic against any suggestion that God, in creating, *became* that which he was not. It is an attempt to address the concern that, if some accidental property did come to be predicated of God, it would undermine immutability and mereological simplicity. God's relation to creation is thus categorized as a 'logical' as opposed to 'real' relation. So, by categorizing God's relation to creation as a logical relation it does not denote anything real in God. Creation's contingency and divine freedom are preserved at the expense of the reality of the relation of God and creation.

Aquinas' doctrine of mixed relations is trying to carry some very important cargo: *God's existence and full realisation does not depend on his relation to anything other than himself.* God's outward relations to creation do not constitute God. Now, it is imperative we carry this cargo, even if the doctrine of mixed relations is a problematic way to do so. We cannot surrender the absolute priority of God in his eternal reality aside from his relations to creation without collapsing God into his relations to creation and demolish both the freedom of God and the freedom of his creation. However, at the same time, we should not affirm God's aseity in a way that makes it impossible to conceive of God's direct action in creation.

If we reconceive of the freedom of God in trinitarian terms, the absolute freedom of God is preserved alongside the reality of God's relation to creation. Should aseity be thought of in terms of God's non-transitive triunity we would arrive at a modified account of simplicity and immutability which affirms rather than undermines God's real relation to creation. In short, *an account of divine perfection which preserves both the freedom of God from creation and the freedom of God to be for creation.*



Creation and the philosophy of science

It is just such a manoeuvre, I suggest, that undergirds an account of creation which is in possession of its own freedom which is given to it by the reality of God's relation to it.

God's aseity is God's freedom. As self-existent, God is grounded in his own being and does not need any other for total self-realisation. God exists out of himself. God's freedom, as Karl Barth said, is grounded in God's own being, determined and moved by himself.⁹ A consequence, *but not component*, of God's freedom is that God is not conditioned by external factors, such as creation. God's freedom is not like the negative liberty of Isaiah Berlin: God's freedom is not constituted by liberty from external interference. If it were, *then freely entering into covenantal relation with creation would undermine his freedom*. As it is, the self-grounded freedom of God means that God can enter covenantal obligations to creation without surrendering his own freedom. The significance of the transcendence of God as the prerequisite of divine communion with creation is admirably demonstrated in John Calvin by Julie Canlis.

Calvin fights for God's transcendence not due to some abstract Nominalist principle but for the purpose of communion. God's transcendence is not God's imprisonment over (and thus out of) the world, but rather his freedom to be present to the world. While God's transcendence is often hailed as the most distinctive mark of Reformed theology, this transcendence – if it is to follow Calvin – must not mean external relationship to the world but the absolute freedom with which God stands in relationship to his creatures. It establishes the radical noncontinuity of grace and the world. It certainly does not establish that grace and the world have nothing to do with each other!¹⁰

If, then, we understand God's aseity in terms of his non-transitive relations, then God's self-grounded existence is conceived of as the fullness of God's triune life. The persons may not be reduced to some anterior unity and nor may the essence be traced back to an anterior plurality or anterior monarchy. The triune God is one divine essence which has its existence in threefold personal modification, differentiated through



respective modes of origin. In his non-transitive relations, the being of God is the one who loves in the perfect, sufficient and self-contained reciprocity of Father, Son and Spirit. God's aseity, therefore, is his triune love.

One effect of forming an equivalence between aseity and God's non-transitive relations is that God's *transitive* relations *are not accidental but is proper to the being of God*. As proper to the being of God and not accidental, God's transitive relations do not undermine simplicity. The simplicity of the triune God is one essence in threefold personal modification existing in a communion of love. His outward turn to us in his transitive relations is an expression of the fact that God does not exist in solitude but in fellowship. The being-of-God-who-loves extends beyond the limitless abundance of his non-transitive love in a generous, volitional fellowship-seeking act toward creation.¹¹ By this connection, the pattern of the triune relations *in se* is the ground and the grammar of God's relations *pro nobis*. However, God's transitive relations do not have a retroactive effect upon the non-transitive. With Rahner, we affirm that the immanent Trinity is the economic, but we do not allow the reverse movement. God enters the limitations of covenantal obligations all the while remaining unchanged in the freedom of his non-transitive relations.

To identify divine freedom in terms of Trinitarian theology allows us to affirm some core dogmas of classical theology and so not divest ourselves of the crucial content that resides within them even if they have become dressed in the garb of discursive, axiomatic or scholastic theology. This is not without its problems. How might the reconceptualising of simplicity avoid the accusation of modal collapse if God's transitive relations are in kinship with his non-transitive relations? Moreover, if God's transitive relations are determined by the non-transitive but the covenantal commitments do not rebound back into the non-transitive, then is there not a risk of inserting a dualism between the immanent and the economic Trinity, leaving us with a God behind the back of Jesus Christ? These are significant problems which will require working through elsewhere.

However, our concern, here, though is not with the doctrine of God *per se* but with how a doctrine of God provides us with the fundamental grammar for a doctrine of creation. By taking our leave from the doctrine



of the Trinity, we are able to affirm both God's freedom *from* creation and God's freedom *to be for* creation. God exists as Father, Son and Spirit quite independent of his relations to us. There is no divine need which creation addresses.¹² The coming into being of creation is not theogony by the back door. In this sense, the absolute freedom of God allows us to make a crucial separation of creation and necessity: God is not bound to creation as a First Cause within a chain of causation. However, this does not mean that creation is the result of chance, for the opposite of necessity is not chance but grace: 'God's triune self-sufficiency means that his relation to created being is gratuitous'.¹³ In this connection, Christoph Schwöbel's exploration of creation as a speech act of the triune God is very helpful in emphasising that creation is a deliberative and purposive act of God taken in the freedom of his choice.¹⁴ In other words, the relation of grace and nature is essential to the actual existence of nature. Such an account of the relation of grace and nature must be articulated in Christological terms and is elaborated on below.

However, such a construction demands that we affirm the reality of God's relation to creation. If creation is dependent on the relation of God to it, then a merely logical relation of God and creation is equivalent to a merely logical existence of creation. If, however, God's freedom from creation is conceived of on Trinitarian terms (and not by a package of certain metaphysical presuppositions, such as immutability or simplicity), then God is not locked into his own freedom in such a way that precludes the reality of his outward relations to creation. Instead, the triune God is free to be for creation. Therefore, while creation is not necessary to God it is in a *real* relationship to God. This real relationship between God and creation is characterized by the volition of God. Creation is not necessary to God; it is *chosen* by God. From this bedrock, we can speak of creation as possessing a contingent freedom. It is brought into existence by the act of God to have a reality quite aside from God's own reality.

Following Fr Florovsky, we may conceptualize the difference between the absolute freedom of God and the contingent freedom of creation through the immeasurable qualitative difference between the generation of the Son from the being of the Father and the making of creation in accordance with the will of the Father.¹⁵ God's non-transitive relations are

the way in which the one God has his life as Father, Son and Holy Spirit. As such, they are constitutive of what it is to be God. These relations are not volitional as if God could have chosen to have his life some other way. These relations are not temporal in the sense that there is some notion of progress or process within the divine life. On the other hand, God's transitive relations are not the way God has his life in eternity and are not constitutive of what God is. These transitive relations are *volitional* (God willed to extend beyond himself and enter relationship with that which is not to make it that which is) and they are *temporal* (creation has its existence in being brought into existence from nothing).

The distinction between the non-transitive and transitive relations of God allows us to give a powerful articulation of the non-necessity of creation.

The world exists. But it *began* to exist. And that means: *the world could have not existed*. There is no necessity whatsoever for the existence of the world. Creaturely existence is not self-sufficient and is not independent. In the created world itself there is no foundation, no basis for genesis and being. Creation by its very existence witnesses to and proclaims its creaturehood, it proclaims it has been produced.¹⁶

Creation is thus characterized by a form of indeterminate possibility. There is no reason for creation to be or for creation to be the way it is, other than the will of God for it to be and to be the way that it is.¹⁷ The contingency of creation, therefore, means that creation does not contain within itself a reason for its existence or for its having existence the way that it does. However, it is precisely this characteristic that clearly distinguishes it from God as that which is given its own life aside from God. The contingency of creation, then, has a complex structure which Torrance has described as the 'interlocking of dependence and independence'.¹⁸ Accordingly, the intelligible order of the universe is not a closed intelligibility that arises out from created reality itself. Instead, it is an intelligible order that is given to it by its being made by the will of the Father through the divine *Logos* in the power of the Spirit. However, if we are to understand the curious



interlocking structure of dependence and independence, it can only be when it is stated with a Christological grammar.



Christ and creation

Andrew Torrance and Thomas McCall's recent volume, *Christ and the Created Order*, opens with the conviction that the Christian claim that in the person of Jesus Christ, God and creation are united but not confused is uniquely relevant for what we think about the natural world.¹⁹ It is in Jesus that God the Creator is revealed within his creation, the character of God's relation to creation and agency within it is made known and it is in Christ that the created order is redeemed and lifted again to the purpose of its existence. However, the concern of this paper is not to go over the ground covered by the excellent chapters regarding the order of creation held together by Christ,²⁰ and the existence of creation through Christ.²¹ This paper takes a different but complementary approach to the matter of how Christology shapes our understanding of the natural world via an analysis of the structure of the hypostatic union as normative over the relation of God and creation in general.

Jesus Christ is the normative example of the relation of God and creation. Rowan Williams has recently explored this theme in his superb study *Christ: The Heart of Creation*, in which he argues that Christology provides the model by which to comprehend the relationship of grace and nature.

God makes the world to be *itself*, to have an integrity and completeness and goodness that is – by God's gift – its own. At the same time, God makes the world to be open to a relation with God's own infinite life that can enlarge and transfigure the created order without destroying it. The model developed in Christology is the model that clarifies all we say about God's relation with the world, the relation between the infinite and the finite, Creator and creation [...]. And all this is summed up in our belief in a Christ who is uninterruptedly living a creaturely, finite life on earth and at the same time living out depths of divine life and uninterruptedly



Creation and the philosophy of science

enjoying the relation that enterally subsists between the divine Source or Father and the divine Word or Son.²²

Williams' focus falls on the overlapping agency of God and creation in the person of Jesus Christ in which the free agency of God on creation does not compromise the free agency of creation and *vice versa*. The focus here does not fall on the question of agency but on the question of *structure*. The following paragraphs explore the normativity of Jesus Christ for the God-creation relation from the structural relation of the divine and human natures in the person of Jesus Christ. The contention is that *the logic of the incarnation is normative for the logic of creation*.

The starting point of such a theological mood is the essential discontinuity between God and nature which, far from precluding God's action in creation, is the prerequisite of God acting in creation without collapsing into it or causing creation to collapse into him. There is no inherent analogical proportionality between God and creation. The analogical proportion between God and human knowing is established in Jesus Christ. This means that the character of the relationship between grace and nature is demonstrated in the union of the divine nature and human nature in the person of Jesus Christ. The hypostatic union as the theological doctrine that articulates the mystery of the incarnation is the archetypal structure that all other accounts of the divine-human relation must be in proportional relation to. Christian theology must take the formal structure of the hypostatic union as its governing structure at all levels from philosophical to applied theology.

The twin concepts of *anhypostasia* and *enhypostasia* constitute the grammar by which we may talk about the union of divine nature and human nature in the person of Jesus Christ without confusion of or change to their mutual integrity and without their division or separation within the person of Jesus. *Anhypostasia* means that the human nature of Jesus Christ had no subsistence prior to God the Son assuming human nature to himself. In so doing, it emphasizes that the human nature of Christ is entirely dependent on the divine act of grace in God the Son assuming it into union with himself. In this way, *anhypostasia* insists upon the priority of the grace of God and the dependence of the human nature upon the

divine will and act for its existence. *Enhypostasia* means that, having been assumed, the human nature of Jesus Christ has a real and true subsistence as human as (or 'in') the person of the Son. In this way, *enhypostasia* insists upon the integrous existence of human nature as truly human, uncompromised by its dependence on the priority of God's grace. *Anhypostasia* and *enhypostasia* are in a vital complementarity. *Anhypostasia* is the presupposition of *enhypostasia*, for it is because the human nature of Jesus has no *per se* subsistence that it must subsist in the person of the Son by merit of his assumption by the Son. This complementarity means that in the incarnate Christ the priority of the grace of God and the integrity of the human nature are preserved.

The programmatic logic of Christology shapes the logic of our doctrine of creation, specifically its contingent freedom. The syntax of the *anhypostasia-enhypostasia* couplet is normative (in an analogical rather than isomorphic way) over our understanding of the interlocking structure of dependence and independence within creation's contingency. Creation is 'anhypostatic' (to create an adjective) in that it is dependent on the act of God to have existence. Creation does not have its existence out of itself but is brought into being by the will and act of God. Creation is 'enhypostatic' in two ways. First, creation is uncompromised in its created nature despite being wholly dependent on the act of God. Second, creation's 'independence' (meaning its distinct and uncompromised reality) has its life within the gracious act and will of God for it out of which it was created and by which it is sustained. The anhypostatic and enhypostatic aspects of creation are in complementarity in that the enhypostatic independence of creation as creation in the will and act of God is a necessary consequence of its anhypostatic dependence.

The correlation of the formal structure of Christology and the contingent freedom of creation allows the theologian to assert the discrete reality of creation within its dependence upon the will of God for it. Not least, this encourages a covenantal view of creation which is made by God's will-to-communion and in which it is responsible to respond in faith, obedience and love. Much more pressing for the current study is that we are able to affirm the integrity of creation as creation alongside its contingency. One objection to this may be that *enhypostasia* is a poor

archetype for the discrete existence of creation because it bears the implication that a created being only has subsistence within the divine. It is for this reason that I have spoken of an analogical structural correspondence rather than a direct isomorphism and suggested that creation has its enhypostatic existence within the *will* of God, unlike the human nature of Jesus which has its existence in the *person* of God the Son.



Creation and the philosophy of science

A theological account of the natural world shaped by the triunity of God and the primacy of Jesus Christ in how we conceive of the relation of God and creation needs to be mediated through philosophy in order to inform the process of scientific discovery. The three areas of this translation fall within the fundamental nature of reason, the character and purpose of theories, and the relationship between human discursivity and the ontic order within the natural world itself.

God stands in a real relation to creation, and this is the relationship that constitutes the real existence of creation. Creation is real aside from the apprehension of the human knower but not aside from the grace of God. Similarly, creation is made to be a certain way and it might have been another way. The way creation is, is a product of the will of God and not the construction of the human knower. God endowed upon creation a way of being, an internal order and coherence. It is this contingent intelligibility that makes creation amenable to our understanding (so, Barth: ‘The *ratio* is the rationality of the object in so far as it makes it intelligible to a being who can understand’).²³ This internal (and contingent) intelligibility exercises determinative influence over the way things appear to us. As such, the way reality appears to us in phenomena is shaped by the internal depths of the coherent order of creation. Truth, in this sense, is primarily ontological and it encompasses both reality as it is in its own inner structures of coherence and reality as it discloses itself to us as it affects our sensibility through phenomena. Such a twofold understanding of truth as reality *in se* and reality *pro nobis* has been well articulated by T. F. Torrance: ‘The truth is that which is what it is and that which discloses



what it is as it is. The concept of truth enshrines at once the reality of things and the revelation of things as they are in reality.²⁴

We can talk in terms here of reality as an emergent system or, in Polanyian terms, of a stratified account of reality in which the intelligible stratum exercises marginal control over the sensible stratum. Such a unitive ontology provides a foundation upon which we may think in a way that the empirical and theoretical elements of our knowing form a synthesis. Crucially, this synthesis is not brought about through self-consciousness, but through the force of reality itself as it discloses itself to us through phenomena. We may find the philosophical tradition of transcendental realism a suitable lexicon for translating this view of the natural world.²⁵ Roy Bhaskar advocates a logic of scientific discovery in which the real but non-empirical generative mechanisms which give rise to and shape the phenomena are the ultimate objects of scientific knowledge.²⁶ This has significance for how the theologian might encourage the natural scientist to think about what reason is and what it is for. Obviously extreme idealism is impossible in an epistemology shaped by theological conviction, for the natural world is not real in relation to the human mind, but it is real in relation to the creative and redemptive (read ‘covenantal’) will of God. However, the more subtle anthropocentrism of transcendental idealism and classical empiricism (along with its twentieth-century correlates in rationalism and logical positivism) must be abandoned as well. Scientific knowledge is not the notation of our response to the stimulus of the iterative disturbance of our sensibility. Nor are scientific theories instrumental accounts of the way things behave with no ontological referent within reality. We do not have to do with mere ideality concerning the order of reality beyond the knower which remains, ultimately, unknowable. Objectivity is not merely the eradication of difference at the level of intersubjectivity. Reason is the conformity of the mind to the truth which is independent from it.

A theological account of the natural world is also of significance with respect to the nature and character of theories. Our theories may be the means that we cognize reality, but cognition is characterized by exposing the inner coherence nascent in reality rather than imposing a cognizable form upon it. In other words, our theories do have an ontic correlate. True



knowledge is to know reality in its inherent connections and order. The rational structure of our conceptual systems is, therefore, not the creation of the human mind but is the integration of the rationality of reality into our conceptual systems. It is not only the truth of our words that is in reference to the reality that they designate, complex conceptual systems which include propositions in reference to other statements also only have truth in reference to the complex ontic structure that has shaped them. Conceptions of truth as exclusively syntactic coherence (e.g., axiomatic systems of valid inference) can have no place within a Christian theology of nature. Here we find ourselves back at the person of Jesus Christ. Chalcedonian Christology does not allow for any disjunction between existence and idea. Truth has given itself to be known in concrete, historical form. The Christian can only think of knowing the truth in concrete, living fashion. We cannot separate existence and idea any more than we can separate the human and divine natures of Jesus Christ. Discursive and intuitive reason belong together in a Christian universe. The rationalistic concern with ideas devoid of experience in which reason operates in accordance with its own laws must be invalidated.²⁷

If we were to expand the implications of this, scientific theories would possess a decidedly unitive character.²⁸ Theories would operate via the cooperation of semantic and syntactic forms of truth. At the semantic level, our propositions describe what is experienced. At the syntactic level, we articulate the relationships such as there are between the statements we make in response to experience (we can call these empirical statements). By merit of the fact that phenomena are governed by an intrinsic intelligibility of reality, a cluster of empirical statements will be characterized by an implicit coherence. Discursive analysis concerns that implicit coherence. Crucially, discursive analysis does not take its leave from *a priori* axioms but from our empirical statements themselves. The task of discursive analysis is to draw valid inferences between empirical statements and so make explicit the relationship between a cluster of empirical statements. In so doing, it will begin to expose the implicit coherence of these statements that describe reality and so also the deep ontic order of the reality that shaped phenomena in the first place. As such, discursive reasoning has the capacity to enhance the disclosure of the



actual ontic order of reality and equip us to describe the depths of coherence in reality itself. However, it is the actual relations and mechanisms (we might call this the ontic logic) within reality itself that shapes the logical structure of conceptual system (we might call this ideal logic). If, then, there is a role for purely discursive forms of logical analysis it is in the strict confines of the artificial separation of a conceptual system as ideality so to test its logical coherence as an epistemic structure. Such is the synthesis of transcendental realism.

The contingency of creation is also very important for the relationship between discursive reason and the ontic logic of reality. The natural universe is not a closed system. It does not have its rationale or order within itself but is open beyond itself to its source, which is the creative wisdom of God. Creation is, therefore, not constituted by necessity. Instead, creation, as contingent upon the will of God for it, is characterised by an open indeterminacy. This has a very important implication: the conceptual structures, through which we articulate the contingent intelligibility of creation, cannot be characterised by a greater necessity than the reality they describe. The natural sciences must be an intuitive discipline if they are to relate properly to the object they are trying to know, meaning that they must be open to a coherent reality beyond themselves knowing that the rational order into which they inquire is not ultimately self-sustaining or self-sourced. Obviously, this means any *a priori* logical system improper for scientific thought. Discursive analysis drawing inferences from axioms in a pure logical necessity is not a way to know something that is contingent.

There is a sharper implication to draw from this. Experiential data must not be understood in accordance with a pre-existing inertial frame of understanding. The logic by which we interpret experience cannot arise from any other source than reality itself. Intuition, the pre-logical insights we have into the coherent order within creation through phenomena, is very important here. It is only by this pre-conceptual apprehension of reality that the levels of discursive reason can truly be contingent upon the actual logic within reality. It is precisely this intuitive insight into reality prior to cognitive formation that is so fragile and vital to our thinking in



accordance with what's there, if it truly is to be knowledge and not the discursive activity of the human mind writ large on the world around us.

Notes

- ¹ Karl R. Popper, *Conjectures and Refutations: The Growth of Scientific Knowledge* (London: Routledge and Kegan Paul, 1963), 175–83.
- ² Stanley L. Jaki, *Science and Creation: From Eternal Cycles to an Oscillating Universe* (Edinburgh: Scottish Academic Press, 1986).
- ³ Georges Florovsky, “On the Substantiation of Logical Relativism”, trans. C. Boyle in *Philosophy: Philosophical Problems and Movement*, Vol. 12 of *The Collected Works of Georges Florovsky* (Vaduz: Büchevertriebsanstalt, 1989), 143–69.
- ⁴ Wolfhart Pannenberg, *Theology and the Philosophy of Science* (London: Darton, Longman and Todd, 1976).
- ⁵ T. F. Torrance, *Theological Science* (London: Oxford University Press, 1969).
- ⁶ T. F. Torrance, *The Ground and Grammar of Theology* (Belfast: Christian Journals Limited, 1980), 1–14.
- ⁷ T. F. Torrance, *The Trinitarian Faith: The Evangelical Theology of the Ancient Catholic Church* (Edinburgh: T&T Clark, 1988), 76–109.
- ⁸ John Webster, “Trinity and Creation”, *International Journal of Systematic Theology*, 12 (2010): 4–19.
- ⁹ Karl Barth, *Church Dogmatics* (ed. G. W. Bromiley and T. F. Torrance; Edinburgh: T&T Clark, 1956–75), II/1: 297–321.
- ¹⁰ Julie Canlis, *Calvin's Ladder: A Spiritual Theology of Ascent and Ascension* (Grand Rapids, Mich.: William B. Eerdmans, 2010), 67 f.
- ¹¹ Barth, *Church Dogmatics*, II/1, 272–97.
- ¹² Augustine, *The Literal Meaning of Genesis*, trans. J. H. Taylor (New York: Paulist Press, 1982), 1:13.
- ¹³ Webster, “Trinity and Creation”, 13.
- ¹⁴ Christoph Schwöbel, “‘We Are All God’s Vocabulary’: The Idea of Creation as a Speech-Act of the Trinitarian God and its Significance for the Dialogue Between Theology and the Sciences”, in *Knowing Creation: Perspectives from Theology, Philosophy and Science*, ed.



- Andrew B. Torrance and Thomas H. McCall (Grand Rapids, Mich.: Zondervan, 2018), 47–68.
- ¹⁵ Georges Florovsky, “Creation and Creaturehood”, in *Creation and Redemption*, Vol. 3 of *The Collected Works of Georges Florovsky* (Belmont, Mass.: Nordland, 1976), 43–78 and “St. Athanasius’ Concept of Creation”, in *Aspects of Church History*, Vol. 4 of *The Collected Works of Georges Florovsky* (Belmont, Mass.: Nordland, 1975), 39–62.
- ¹⁶ Florovsky, “Creaturehood”, 45.
- ¹⁷ Thomas F. Torrance, *Divine and Contingent Order* (Edinburgh: T&T Clark, 1981), viii.
- ¹⁸ *Ibid.*, 35.
- ¹⁹ Andrew B. Torrance and Thomas H. McCall, “Introduction”, in *Christ and the Created Order: Perspectives from Theology, Philosophy, and Science*, ed. Andrew B. Torrance and Thomas H. McCall (Grand Rapids, Mich.: Zondervan, 2018), 15 f.
- ²⁰ Murray Rae, “Jesus Christ, the Order of Creation”, in *ibid.*, 23–34.
- ²¹ Norman Wizbra, “Creation Through Christ”, in *ibid.*, 35–53.
- ²² Rowan Williams, *Christ: The Heart of Creation* (London: Bloomsbury, 2018), xiii.
- ²³ Karl Barth, *Anselm: Fides Quaerens Intellectum: Anselm’s Proof of the Existence of God in the Context of His Theological Scheme*, trans. I. Robertson (London: SCM Press, 1960), 50.
- ²⁴ Thomas F. Torrance, *Transformation and Convergence in the Frame of Knowledge: Explorations in the Interrelations of Scientific and Theological Enterprise* (Eugene, Or.: Wipf & Stock, 1998), 303.
- ²⁵ Such an approach is taken by Alister E. McGrath in *A Scientific Theology: Volume 2: Reality* (London: T&T Clark, 2002), 195–243.
- ²⁶ Roy Bhaskar, *A Realist Theory of Science* (London: Verso, 1997).
- ²⁷ For a very interesting dialogue on exactly this point, see the exchange between T. F. Torrance and Brand Blanshard in April 1952. See Iain and Morag Torrance, eds., “A Skirmish in the Early Reception of Karl Barth in Scotland: The Exchange Between Thomas F. Torrance and Brand Blanshard”, *Theology in Scotland* 16.3 (2011): 5–22, <https://ojs.st-andrews.ac.uk/index.php/TIS/article/view/845/723>. For my exposition of these letters, see A. J. D. Irving, “The Nature and Purpose of Reason in Christian Theology: The 1952 Exchange Between Thomas F. Torrance and Brand Blanshard”, *Theology in Scotland* 25.1



Creation and the philosophy of science

(2018): 19–34, <https://ojs.st-andrews.ac.uk/index.php/TIS/article/view/1644>.

²⁸ These implications have been expanded at length in Torrance, *Theological Science*, 203–80.