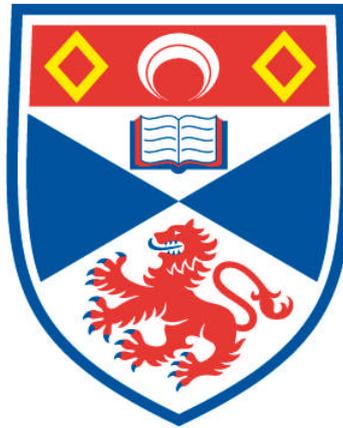


**KATA PHYSIN: A CRITICAL EXPLORATION OF THE
EPISTEMOLOGY OF T.F. TORRANCE AS IT RELATES
TO THE PHILOSOPHY OF THEOLOGICAL AND
NATURAL SCIENCE**

Travis M. Stevick

**A Thesis Submitted for the Degree of PhD
at the
University of St Andrews**



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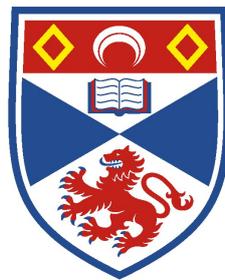
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Kata Physin: A Critical Exploration of the Epistemology of
T. F. Torrance as it Relates to the Philosophy of Theological
and Natural Science

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University of
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This thesis is submitted in partial fulfilment for the degree of

Doctor of Philosophy

at the

University of St Andrews

27 July 2015

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Abstract

According to T. F. Torrance, all authentic knowledge involves the nature of the object impressing its inherent rationality on our minds. Consequently, knowledge involves thinking in accordance with the nature of the object given for thought. Given that this epistemological position is not presuppositionless, we shall explore the place and function of "ultimate beliefs" in Torrance's epistemology, as well as the question as to whether such beliefs imply a retreat to either foundationalism or fideism.

The inescapability of ultimate beliefs in all human knowledge requires a shift in the traditional notion of objectivity. Consequently Torrance's understanding of objectivity, and the reasons for his insistence that the subject-object relation cannot be transcended, are analyzed. Additionally, our ability to keep our tendency toward subjectivity in check is considered. It is also argued that Torrance's epistemological position implies an alternative notion of truth. Drawing on distinctly Christian sources, Torrance emphasizes the distinction between truth and truthfulness thereby reorienting the discussion from a focus on *statements* to a focus on *being*. This shift challenges the dichotomy between correspondence and coherence theories of truth and provides one way of transcending the scientific realism/anti-realism debate. Torrance's position on truth is located relative to other well-known thinkers.

Torrance's epistemological convictions give rise to a practical epistemological tool, disclosure models. These function as self-correcting, self-marginalizing lenses through which we encounter reality, allowing it to disclose itself to us. It is this constant disclosure and revision that enables our concepts to remain rooted in reality and yield knowledge in accordance to the nature of the thing known.

Acknowledgements

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Most of all, I want to thank my wife, Alli, for her tremendous support and willingness to be uprooted, along with our family, and move thousands of miles from home with no idea where this adventure would lead. This would not be possible without your love and dedication

Dedication

This thesis is dedicated to my two great teachers. To Professor Elmer Colyer who introduced me to the theology of T. F. Torrance for the first time and fanned the flame of my interest. Also to Professor Alan Torrance, whose expertise, flexibility and encouragement made this project the most enjoyable of my life so far.

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Abbreviations

Thomas F. Torrance

- BS&CL* *Belief in Science and in Christian Life: The Relevance of Michael Polanyi's Thought for Christian Faith and Life*. Edinburgh: The Handsel Press, 1980.
- CDG* *The Christian Doctrine of God: One being, Three Persons*. Edinburgh: T & T Clark, 1996.
- CFM* *The Christian Frame of Mind*. Colorado Springs: Helmers and Howard, 1989.
- CT&SC* *Christian Theology and Scientific Culture*. Oxford: Oxford University Press, 1980.
- D&CO* *Divine and Contingent Order*. Oxford: Oxford University Press, 1981.
- DM* *Divine Meaning: Studies in Patristic Hermeneutics*. Edinburgh: T & T Clark, 1995.
- G&R* *God and Rationality*. Oxford: Oxford University Press, 1971.
- G&F* *The Ground and Grammar of Theology*. Charlottesville, VA: The University Press of Virginia, 1981.
- HJC* *The Hermeneutics of John Calvin*. Edinburgh: Scottish Academic Press, 1988.
- JL&PL* *Juridical Law and Physical Law*. 2nd ed. Eugene, CO: Wipf and Stock, 1997.
- KB* *Karl Barth: An Introduction His Early Theology, 1910-1931*. London: SCM Press, 1962.
- MC* *The Mediation of Christ*. Revised ed. Colorado Springs, CO: Helmers and Howard, 1992.
- PCT* *Preaching Christ Today: The Gospel and Scientific Thinking*. Grand Rapids, MI: Wm. B. Eerdmans, 1994.
- R&ET* *Reality and Evangelical Theology*. Philadelphia: Westminster Publishing Co., 1982.
- R&ST* *Reality and Scientific Theology*. Revised 2002, Wipf and Stock ed. Edinburgh: Scottish Academic Press, 1981.
- ST&I* *Space, Time and Incarnation*. Oxford: Oxford University Press, 1969.
- ST&R* *Space, Time and Resurrection*. Grand Rapids: Wm. B. Eerdmans Publishing Company, 1976.
- “TR” “Theological Realism.” In *The Philosophical Frontiers of Christian Theology: Essays Presented to D. M. MacKinnon, 169-96*. Cambridge: Cambridge University Press, 1982.
- TS* *Theological Science*. Oxford: Oxford University Press, 1969.
- TReconcil* *Theology in Reconciliation: Essays Towards Evangelical and Catholic Unity in East and West*. Grand Rapids: Wm. B. Eerdmans Publishing Company, 1975.

- TReconstr* *Theology in Reconstruction*. Grand Rapids: Wm. B. Eerdmans Publishing Company, 1965.
- “TFTR” "Thomas Torrance Responds." In *The Promise of Trinitarian Theology: Theologians in Dialogue with T. F. Torrance*, edited by Colyer, Elmer M., 303-340: Rowman & Littlefield, 2001.
- T&C* *Transformation and Convergence in the Frame of Knowledge*. Grand Rapids: Wm. B. Eerdmans Publishing Company, 1984.
- TF* *The Trinitarian Faith: The Evangelical Theology of the Ancient Catholic Church*. Edinburgh: T. and T. Clark, 1988.

Introduction

Bruce McCormack has called T. F. Torrance "the most significant theologian of the late-twentieth century."¹ This claim seems to be supported by the fact that the literature exploring and evaluating Torrance's thought is already rather large and growing steadily.² This bears witness to his tremendous influence in theological areas such as Christology, Trinitarian theology, atonement, and other classical loci in the study of Christian faith. What is comparatively underrepresented is Torrance's considerable work in epistemology. This is not to say that Torrance's commentators have utterly neglected his epistemology - indeed, most of the major works on Torrance include at least some discussion of it. What is remarkable, however, is that it has not yet received a detailed analysis, nor has it been brought into dialogue with the significant works in secular philosophy of science that were available during his academic career.³ Given that over forty-five years have passed since the publication of *Theological*

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- 1 Endorsement for Alister McGrath, *T. F. Torrance, an Intellectual Biography*. Edinburgh: T & T Clark, 1999.
 - 2 The interested reader can pick up the following monographs: an intellectual biography covering Torrance's life (McGrath, *T. F. Torrance, an Intellectual Biography*. (Edinburgh: T & T Clark, 1999)), an overview of the major themes in Torrance's work (Elmer M. Colyer, *How to Read T. F. Torrance: Understanding His Trinitarian and Scientific Theology*. (Illinois: Intervarsity Press, 2001)), an engagement with Torrance's doctrine of the Trinity (Paul D. Molnar, *Thomas F. Torrance: Theologian of the Trinity*. (Burlington, VT : Ashgate Pub. Ltd., 2009)), an analysis of the function of doctrine in Torrance's thought (Elmer M. Colyer, *The Nature of Doctrine in the T. F. Torrance's Theology*. (Eugene, OR: Wipf and Stock, 2001)), an extended dialogue between Torrance and philosopher Paul Feyerabend (*Is Theology a Science?: The Nature of the Scientific Enterprise in the Scientific Theology of Thomas Forsyth Torrance and the Anarchic Epistemology of Paul Feyerabend*. *Studies in Systematic Theology*, edited by Bevans, S. V. D., Miikka Ruokanen. Vol. 7. (Leiden, The Netherlands: Koninklijke Brill, NV, 2011)), a treatment of Torrance's engagement with the natural sciences (Tapio Luoma, *Incarnation and Physics: Natural Science in the Theology of Thomas F. Torrance*. Oxford: Oxford University Press, 2003), and several others, more coming into print every year.
 - 3 By "secular philosophy of science" is merely meant the work of philosophers of science who are doing their work without any explicit theological concerns. This would exclude the work of those working explicitly in the theology-science dialogue.

Science,⁴ and the considerable amount of work Torrance published after it, it seems surprising that this lacuna has not yet been filled when one might have expected a host of works providing commentary on this important topic.

The aim of this thesis is to unpack and critically explore what has been called the "fundamental axiom of Torrance's theology,"⁵ the conviction that we know something authentically only when we know it according to its own nature, what Torrance describes as knowledge that is "*kata physin*." This claim seems uncontroversial and yet we see in Torrance's theology that it has far-reaching implications.

Chapter one introduces the concept of "*kata physin*" as well as how it functions in Torrance's thought. It will be argued that Torrance's resistance to dualist, positivist, and reductionist ways thinking flows from his conviction that such thinking is not implied by the objects of our knowledge but that they are generated by other concerns and then *imposed* upon such objects. Unpacking this conviction will allow for an evaluation of whether Torrance, for all his dislike of dualism, might be harboring some dualistic tendencies of his own.

The conviction that one knows something truly only when one knows it in accordance with its nature is not value-neutral but relies upon certain key suppositions; namely, that there exists something to know and that one has some kind of epistemic access to it. This raises the question as to whether background beliefs of this kind, especially those that can be neither verified nor falsified, have a legitimate place within epistemology and, if so, how they function. It is this question over what Torrance calls "ultimate beliefs" that lies at the core of actual and potential criticisms that he is a foundationalist or a fideist. These are the concerns explored in chapter two.

If it is the case that ultimate beliefs are, as Torrance claims, unavoidable, it has implications for our understanding of objectivity. If it is the case that we are never able to speak unambiguously of "the facts," then this raises the question as to whether there is any other conclusion than that we are stuck with radical subjectivism in all our interactions within the world of space-time in which we live. Chapter three examines

4 TS.

5 Colyer, *The Nature of Doctrine in the T. F. Torrance's Theology*, 15.

the problems faced by a traditional concept of objectivity when it is granted that we may never ignore the knowing subject, that the subject-object relationship can never be utterly transcended. Torrance's concerns push us to conceive of objectivity primarily in terms of the object we seek to know rather than in terms of the knowing subject. That is to say, rather than asking how it is that *we* may be objective, we must learn to ask and answer the question, "How can we let *what we seek to know* be objective to us?"

Torrance's insistence that we allow the objects of our knowledge to have utter primacy over our statements about them leads to an alternative theory of truth. Chapter four engages with the question as to how our statements, theories, and doctrines relate to the reality they intend. We shall see that both a correspondence theory of truth, which roots truth in our *individual* statements, and a coherence theory of truth, which roots truth in our *systems* of statements, rely upon the subject-object dualism that Torrance rejects. In their place, Torrance stresses that the truth of our *statements* must always be secondary to the *reality* to which they refer (what Torrance calls the "truth of being"). Torrance's ontological notion of truth will be shown to be different in some crucial ways from that developed by other theologians, such as Thomas Aquinas.

In our scientific age the most relevant of these implications is how Torrance's notion of truth shapes his understanding of the function of scientific theories, discussed in chapter five. For Torrance, theories function as "disclosure models" that self-consciously subordinate themselves to that to which they bear witness. Historic issues within the philosophy of science such as verifiability, falsifiability, paradigm shifts, meaning variance, the underdetermination of theory by evidence, and approximate truth are transformed and given an interpretation that might provide one possible way toward their resolution.

If Torrance's epistemology is as relevant as we seek to argue, he is truly a theologian for our times. In his writings we find one way of theology and science interacting with one another, challenging one another, and bringing into constructive relationship what society, since the Enlightenment, has widely assumed must remain separate. Although we shall move beyond Torrance's position in certain ways and correct it in others, he seems to provide a model of one way for theologians to critically engage the world of natural science. If Torrance can be shown to have achieved even

modest success in this endeavor, this is highly significant not least, but not only, for those who wish to live as committed Christians *within* this scientific culture and not merely *against* it.

1. What is (Authentic) Knowledge?

We know things strictly in accordance with their natures or what they are in themselves and at the same time we allow what things actually are to reveal themselves to us and thereby to determine for us the content and the form of our knowledge of them. Proper knowing takes place through a steady dynamic interaction between our minds and objective reality.

We encourage our thinking to adapt itself to the structural relations and coherent patterns already inherent in nature independent of our knowing of it and so to predominate over any antecedently conceived frames of thought on our part, and thereby we learn more and more to appreciate the contingency, subtlety, richness, variability, and complexity of nature.

Thus epistemological and ontological considerations are dynamically wedded in our inquiries and formulations.¹

For T. F. Torrance, all authentic knowledge is knowledge according to the nature of that which is known; it is knowledge *κατά φύσιν*. This conviction is the basic axiom of Torrance's epistemology.² Knowledge of anything, whether of God or of creation, is primarily an act of submission, an allowing of that-which-we-seek-to-know to dictate for us how we shall know it. Kataphysic knowledge is not based on good *reasons* for belief, but that the reality we seek to know is what it is and not something else. In order to appreciate Torrance's position, it must be noted that his views are not to be understood as part of the tradition, in analytic philosophy, to provide a formal definition of knowledge.

One particularly influential definition of knowledge is that it is justified true belief. Edmund Gettier, in his well-known 1963 paper, "Is Justified True Belief

1 *CT&SC*, 27-28.

2 Elmer M. Colyer, *The Nature of Doctrine in T. F. Torrance's Theology*. (Eugene, OR: Wipf and Stock, 2001), 15. Cf. *DM*, 141, 211; *G&R*, 52-53, 89-95, 114-116; *R&ST*, 50; *CFM*, 72; *G&G*, 8-10, 33; *MC*, 2-5; *TS*, 25-26, 198; *T&C*, 221.

Knowledge?"³ critiqued this view, revealing its inadequacy. One major response to the so-called "Gettier Problem" is to attempt to articulate what must be *added* to the notion of knowledge as justified true belief so as to secure it from its weaknesses. In contemporary philosophical theology, such an approach is represented by Alvin Plantinga and his development of the idea of "warrant"⁴ and the associated debates involving Swinburne and others.⁵

It is more helpful to consider Torrance's position in light of the discussions we find within the philosophy of science, a field with its own epistemological concerns. In the decades since Thomas S. Kuhn published his *Structure of Scientific Revolutions*,⁶ philosophers of science have been forced to ask of even would-be scientific knowledge, "Justified to whom, or against the background of which point of view?" It has largely reached consensus that we cannot assume that attempts at justification weigh equally heavily against a variety of conceptual backgrounds and so we cannot assume that "justification" is an unambiguous term that is in no need of further analysis.

Related to this, we must ask what we mean when we say that a belief is "true." For example, the belief in absolute space and time or action at a distance would have been considered justified and true when considered against the background of classical physics. However, the same cannot be said when we take the same beliefs within the context of relativity physics. The very notion of "truth" seems to have been approached very differently within the philosophy of science than it has been within other areas of analytic philosophy, such as that represented by contemporary analytic epistemology.

3 Edmund L. Gettier, "Is Justified True Belief Knowledge?" *Analysis* 23, no. 6 (June, 1963): 121-123.

4 See *Warrant: the Current Debate*. (New York: Oxford University Press. 1993), *Warrant and Proper Function*. (Oxford: Oxford University Press. 1993), and *Warranted Christian Belief*. (New York: Oxford University Press. 2000).

5 Richard Swinburne, "Plantinga on Warrant." *Religious Studies* 37, no. 2 (June., 2001): 203-214.

6 Thomas S. Kuhn, *The Structure of Scientific Revolutions*. 3rd ed. (Chicago: University of Chicago Press, 1996).

What does Torrance mean by "kata physin" and what are the origins of this concept?

Torrance, it seems, approaches the question as to what makes knowledge authentic from an entirely different perspective. He claims that "knowledge is real only as it is in accordance with the nature of the object, but the nature of the object prescribes the mode of rationality we have to adopt towards it in our knowing, and also the nature of the demonstration appropriate to it."⁷ The term that Torrance uses to describe this kind of knowledge is the Greek expression *κατά φύσιν*.

This technical term comes primarily, as Torrance understands it, from Greek Patristic sources. Athanasius used the phrase "according to nature" as effectively equivalent to "according to truth" or "according to the economy."⁸ However strong this connection was made in antiquity, it is certainly the case that, for Torrance, knowledge according to nature (*episteme kata physin*) is to be understood as being identical with knowing something in truth.

In any rigorous scientific inquiry you pursue your research in any field in such a way that you seek to let the nature of the field or the nature of the object, as it progressively becomes disclosed through interrogation, control how you know it, how you think about it, how you formulate your knowledge of it, and how you verify that knowledge. I often speak of this as *kataphysic inquiry*, a term that comes from the Greek expression *κατά φύσιν*, which means "according to nature." If you think of something in accordance with its nature like that, you think of it in accordance with what it *really* is — so that here thinking *κατά φύσιν* is to think *κατ' ἀλήθειαν*.⁹

While it is clear that Torrance sees his understanding of authentic knowledge to be in continuity with that of the ancient Nicene theologians such as Athanasius¹⁰ and,

7 *TS*, 198. See also *TReconstr*, 15.

8 *DM*, 383.

9 *PCT*, 45.

10 *DM*, 204-205.

before him, Irenaeus,¹¹ he does not think that it is necessarily a distinctly Christian conviction. Indeed, he argues that "Irenaeus was applying the disciplined, scientific approach in knowledge that had been handed down in the Aristotelian and Stoic philosophies."¹²

Even though a commitment to knowing *kata physin* is not *inherently* Christian, it seems clear that Torrance believes that the converse is true, that Christian convictions press one to affirm such an epistemological position, even if expressed in different terms. Torrance frequently articulates what he believes to be the core of Christian convictions in the expression, "What [Jesus Christ] is toward us He is eternally and antecedently in Himself, but what He is in Himself He is toward us within our life in space and time."¹³ This is one of Torrance's favorite ways to express the importance and centrality of the doctrines of the Incarnation and Hypostatic Union in all Christian thought. Indeed, he describes this conviction as being "the crucial issue" at the first Council of Nicaea and its affirmation as giving voice to what the church had always believed.¹⁴

This expression of Torrance's understanding of the core convictions of Christian faith makes it clear that, at least as far as our knowledge of God is concerned, Christians must make something like *kata physin* their epistemological position since, in Jesus Christ, we encounter one who is God according to God's own nature at the same time that he shares our human nature in our world of space-time. Because we are given a revelation of the very being of God, it would be manifestly inappropriate to attempt to develop knowledge of God upon grounds independent of those provided in Christ.¹⁵ Merely apophatic or abstract accounts of God cannot count as "knowledge" of God since they do not represent God according to God's nature as revealed in Jesus Christ

11 *DM*, 106.

12 *DM*, 106.

13 *TS*, 208. For this expression and variations of it, see *D&CO*, 7; *R&ET*, 24, 110, 124; *R&ST*, 183; *TReconstr*, 182; *TF*, 339; *TS*, 141, 234; "TR," 185; *G&G*, 40, 118, 158, 161; *CDG*, 1, 99, 136, 142, 172.

14 "TR," 185; *CT&SC*, 30-31.

15 This is the core of Torrance's opposition to natural theology in anything resembling the traditional sense. This resistance would certainly seem to be every bit as strong as Barth's.

but derive from elsewhere. It is only because God has made his own nature known to humanity in Christ that we can have kataphysic knowledge of God and therefore consider theology to be scientific.¹⁶

It must be noted that simply demonstrating that Torrance believes that Christian faith implies something like *kata physin* as an epistemological principle for theological knowledge is not sufficient to make the same claim for knowledge more generally. One cannot make the *a fortiori* claim that "If we must know God according to his nature, how much more must we know creation according to *its* nature." Once the existence of God is granted, one could easily argue that we know reality truly, not when we know it in accordance with its own nature independently conceived but in accordance with the nature of God and God's intentions for it.

Though theological epistemology cannot *prescribe* a general epistemology it may *suggest* one. When speaking of our knowledge of the objects of natural science, Torrance does so in precisely parallel language to our knowledge of God. "If nature is not in itself what it is in its relations toward us, if we are not able to grasp nature in the depth of its own reality, then we are not really concerned with science but only with useful arrangements of our own observations and experiments."¹⁷ Though Torrance never makes an explicit argument that we can take the same approach, *mutatis mutandis*, in our epistemological engagement with created things as with God, he seems to see them as parallel with one another. This capacity of the findings of theological science to *suggest*, though never *prescribe*, courses of action for the natural sciences is one important aspect of Torrance's philosophy of science.

Torrance always wrote as a theologian and never primarily as a philosopher of science or historian. As such, his appropriation of various ideas throughout the history of philosophy are somewhat uneven. When Torrance takes up an idea or argument from a historical thinker it is to bring it into service of his larger theological concerns. This means that, when Torrance reflects on the nature of science, he is not attempting to

16 It is because of the unique status of Christ within the context of Christian faith (which, for Torrance, is always Nicene) that it would seem that Torrance would not suggest that theology can equally be considered scientific within the context of other religious views.

17 "TR," 189. See also *G&G*, 161-162, which makes the same point with a closer allusion to an Einsteinian aphorism to which we shall return in chapter 2.

answer the question, "How does (or should) science function" but rather, "How should science function *if the gospel is true?*" While Torrance's philosophy of science arises from a distinctly Christian starting point, it provides an understanding of science which could conceivably be appropriated even by one who does not share his Christian faith.

What does Torrance think are the Conditions of knowing Kata Physin and how does Torrance address this question?

The idea that true knowledge is knowledge according to a thing's nature is not value-neutral. There are some conditions that must be satisfied in order to obtain such knowledge. The first requirement is that there must be a "reality" actually existent in the universe in the sense that the objects of our knowledge are not *merely* constructs, either of individual minds or of communities. If there is no such independently existing reality, then there is no nature in accordance with which it is to be known.¹⁸

Additionally, if one is to have knowledge of such a reality, there must be some kind of epistemic *access* to it.¹⁹ The requirements for this access are very weak inasmuch as it need not be *complete* nor *infallible*, though it must be *reliable*. In other words, when we have access to a reality, our conceptual grasp of it need not be entirely adequate. We may, in the process of our inquiry, discover another aspect of the reality than we expected at the beginning. Consider, for example, the development of atomic and sub-atomic physics. Knowledge of the existence of atoms is possible without being aware of the existence of electrons and other sub-atomic particles.

Our epistemic access to reality also need not be (and never is) infallible. It is entirely possible that our first contacts with a particular reality are baffling and only

18 This is not to say that, for the principle of *kata physin*, existence logically precedes essence. Rather, the two are equally primordial.

19 Making a similar point, Tapio Luoma, *Incarnation and Physics: Natural Science in the Theology of Thomas F. Torrance*. (Oxford: Oxford University Press, 2003), 65, writes, "Torrance's realism does not, therefore, contain only the belief in the existence of reality independent of an observer but also the conviction that, in the ideal case, this independent reality can and must be allowed to determine what we can know about it."

after long and hard work are we able to bring our understanding to conceptual clarity. We are aware that it often takes time to develop the conceptual framework or perceptual skills necessary to discern what is really the case.²⁰ However, our access must be *reliable* in the sense that we actually *do* come into contact with the reality and that, as we continue our investigation, we are not being fundamentally deceived.²¹

It must be noted that such an analysis of the conditions of *kataphysic* knowledge is entirely absent from Torrance's own writing. Indeed, there is no point where there is even a hint that the question as to what is required for his epistemology to be intelligible bothers him or has even occurred to him. There are a few places where Torrance seems to hint that such conditions are required,²² but he is utterly untroubled by it. It seems that he would find any sincere objection to the conditions of knowing *kata physin* to be unthinkable. For Torrance, God is not merely an idea but an existent reality whose existence he feels he cannot deny without denying his own rationality.²³ Additionally, in Jesus Christ, we have epistemic access to God in God's own being. As long as we are considering theology from the point of view of Nicene Christianity, authentic knowledge of God according to the divine nature is indeed possible.

It would seem that Torrance would find a sincere objection to kataphysic knowledge within the realm of natural science to be preposterous as well. Physicists, for example, do not *prove* the existence of the reality they are studying; rather, they *assume* it.²⁴ The fact that physicists proceed in their studies through the use of experimentation shows that they believe that there is, in fact, epistemic access to physical reality.

20 Polanyi discusses the development of skills in *Personal Knowledge: Towards a Post-Critical Philosophy*. (Chicago: University of Chicago Press, 1958), 49-65. See also Feyerabend, *Three Dialogues on Knowledge*. (Cambridge, Mass: Blackwell, 1991), 104-106.

21 It is in this way that Torrance's views require a belief in a form of induction. We shall return to this in chapter 2 in the discussion on ultimate beliefs.

22 Most directly in *TS*, 89. See also *JL&PL*, 3; *TF*, 52.

23 *TS*, ix.

24 Torrance quotes Einstein with approval. "The belief in an external world independent of the perceiving subject is the basis of all natural science." *CT&SC*, 57-58. Also see *TS*, 3.

Torrance does not claim that his position is radically new. Rather, it is a recovery of what he calls "the classical attitude of mind."²⁵ Indeed, he sees it as implied in our ordinary epistemological procedure in our everyday lives. His reflections on this are worth considering at length.

The fundamental principle that I have been concerned with is a very simple one, but its implications are deep and far-reaching when worked out consistently over the whole range of human knowledge. We know things in accordance with their natures, or what they are in themselves; and so we let the nature of what we know determine for us the content and form of our knowledge. This is what happens in our ordinary, everyday experience and knowledge, when, for example, we treat trees in accordance with their nature as trees and not as rocks, or treat cows in accordance with their nature as cows and not as horses, or treat human beings in accordance with their nature as persons and not as things. Science, in every field of our human experience, is only the rigorous extension of that basic way of thinking and behaving. This is a way of understanding scientific activity that is much more appropriate to the complexity and richness of nature as it becomes disclosed to us through the great advances of the special sciences than is that way to which we became accustomed within the compass of a mechanistic universe and its rigid instrumentalism. This is particularly evident in the field of biology, where advance has been obstructed through reduction of organismic relations into mechanistic concepts. Nature must be respected and courted, not imposed upon. We must let it develop and flower, as it were, under our investigations. That is surely required if we are really to know anything in accordance with what it is in itself, and not simply along the lines of its artificial reaction to our tormenting distortion of it. Science is not, therefore, something to be set against our ordinary and natural experience in the world, but, on the contrary, is a development and a

25 For the classical attitude of mind as contrasted with the "modern," see "Classical and Modern Attitudes of Mind," in *R&ST*, 1-31.

refinement of it, with a deeper penetration into the natural coherences and patterns already embedded in the real world and already governing our normal behavior day by day.²⁶

It is Torrance's conviction that he is advocating nothing more than a "rigorous extension of [our] basic way of thinking and behaving."²⁷ However, he is also aware of differing perspectives. We shall return to these rival positions presently, after exploring Torrance's position in relation to other forms of realist epistemology.

How does Torrance's approach differ from other forms of realist epistemology?

Reality and realism are frequent topics of discussion in Torrance's writing. This makes it important to examine where Torrance's realism differs from other forms of realist epistemology. It should be noted right away that Torrance differs from certain forms of realist epistemology inasmuch as he seems to be completely uninterested in settling the question as to whether abstract entities exist. For example, nowhere in the Torrance corpus can one find a discussion of whether numbers truly "exist." Questions of moral realism also seem conspicuously absent from Torrance's thought, especially as one might expect him, as a theologian, to take a stance on whether Christian morality is "real."²⁸ Additionally, there is no attempt to understand reality or realism by using formal language as we see in someone such as Alfred Tarski.²⁹ This means that there are

26 *G&G*, 8-9.

27 *G&G*, 33. Similar expressions can be found in *G&R*, 42; *T&C*, 92; *TS*, 107, 317.

28 When considered in the light of Torrance's whole theological approach, this absence is not so surprising. To claim ontological status for virtue, even Christian virtue, in any way that would make it seem as though such a discussion could take place *independently* of the self-revelation of God in Christ, such as we find in the Platonic Socrates, would likely, to Torrance, seem to be a form of traditional natural theology which he categorically rejects.

This is the case even in Torrance's pamphlet, "The Being and Nature of the Unborn Child," (Scottish Order of Christian Unity, 2000). Torrance's argument derives its force from the concrete revelation of God in Christ rather than some abstract and transcendent notion of the "good."

29 Alfred Tarski, "Truth and Proof." *Scientific American*, vol 220 (6), (Jun 1969). 63-77. The aspects of Tarski's work that *can* be brought into dialogue with Torrance will be discussed in chapter four.

entire discussions of what it means to be a "realist" that cannot even be brought into dialogue with Torrance.

If one turns one's attention to where Torrance falls within the landscape of *scientific* realism, he seems to be difficult to place. He consistently asserts his commitment to realism, yet he is silent with regard to the stereotypically realist concerns as to whether our theories ought to be interpreted literally or whether they may legitimately speak of entities that do not exist. Indeed, Torrance affirms the validity and rationality of theoretical concepts which, while important in the historical development of doctrines, have had to be rejected, such as transubstantiation.³⁰ He rejects what he calls "picturing models" and the one-to-one correspondence theory of truth that they imply,³¹ and he acknowledges the importance of the phenomena described by Kuhn as paradigm shifts, though he prefers to speak of changes in "frameworks of thought."³²

One of the intriguing aspects of Torrance's realism is that it seems to be so different from other forms of scientific realism. We never find, for example, a notion of "approximate truth" or "inference to the best solution," so common in realist literature contemporary with and subsequent upon Torrance's career.³³ It would seem that, if one did not take Torrance's vehement declarations of realism to heart, one would have to conclude that, in the end, Torrance is an anti-realist. Closer examination of Torrance's own writing as well as the discussion in secular philosophy of science on the topic of scientific realism as it existed during Torrance's career, however, will reveal that Torrance, for all his resonance with certain aspects of scientific anti-realism truly *is* a

30 *T&C*, 326-327; *ST&R*, 124-125.

31 For Torrance's rejection of "picturing models," see *T&C*, 255, 274-275; *TReconstr*, 92, 96; *G&G*, 124.

32 For Torrance's use of "frameworks of thought," see *BS&CL*, 19; *PCT*, 49-50; *R&ET*, 9-10, 81; *R&ST*, 115-116; *T&C*, xii, 3, 81; *MC*, 3-4; *G&G*, 93; *CDG*, 28; *ST&R*, 14-15, 174.

33 See Stathis Psillos, *Scientific Realism: How Science Tracks Truth*. *Philosophical Issues in Science*, edited by Newton-Smith, W. H. (New York: Routledge, 1999), 261-279; Jarrett Leplin (ed.), *Scientific Realism*. (Berkeley and Los Angeles: University of California Press, 1984); André Kukla, *Studies in Scientific Realism*. (Oxford: Oxford University Press, 1998); André Kukla and Joel Walmsley. "A Theory's Predictive Success does Not Warrant Belief in the Unobservable Entities it Postulates." In *Contemporary Debates in Philosophy of Science*, edited by Hitchcock, Christopher, 133-148. (Malden, MA: Blackwell, 2004).

realist. Indeed, his understanding of "the real" and its relation to theoretical representation is one of the more interesting, and underexplored, elements of his theology. Unpacking this issue is one of the major tasks of this thesis, so we shall leave this analysis until we have probed Torrance's realist epistemology further.

Torrance cites various thinkers throughout history as exemplifying his epistemological values and demonstrating the kind of thinking that is demanded by the principle of *kata physin*. These thinkers, theologians and scientists, are separated temporally, from the fourth century to the twentieth, and represent a group of people who, it would seem, would not be grouped together for any other reason.

The first example of the kind of *kataphysic* thinker that Torrance recommends is Athanasius. In spite of the numerous references to the great Alexandrian theologian scattered throughout Torrance's work, the key methodological lesson we can learn from Athanasius can be found in his two works, *Contra Gentes* and *De Incarnatione*.³⁴ In them, Torrance argues,

All *a priori* arguments are set aside and any argumentation from an epistemological or cosmological system people may have inherited prior to or independently of their actual knowledge of God as the Father of Jesus Christ. Nor is there any attempt made to derive knowledge of God abstractively from the Holy Scripture or out of the manuals of earlier theologians, but rather through a reasoned movement of thought within the field of Christian experience and faith to penetrate into its intrinsic order and intelligibility.³⁵

That Athanasius was committed to knowing God in his own nature is manifest by his rejection of conceptual systems derived from outside of the gospel and his rejection of abstractive ways of thinking.

The second thinker Torrance cites as an example of *kataphysic* thinking is Anselm of Canterbury.

Here again we find a way of open inquiry that refuses to operate logico-deductively from fixed *principia* or traditional authorities, whether they

³⁴ *R&ST*, 86-88. See also *T&C*, 276-277.

³⁵ *R&ST*, 86-87.

are ecclesiastical or biblical, but insists on keeping close to the ground of actual faith and experience...Anselm proposed a way of inquiry which methodologically sets aside even biblical statements regarded as formal premisses, or which passes through them to the solid truth on which they rest, in order that the mind may be brought directly under the compulsion of the truth and the impress of its rationality.³⁶

For Torrance, one of the great lessons to learn from Anselm is the idea that truth is something far greater than can be captured in our statements.

He worked with a hierarchy of different levels in which his thought moved from the truth of statement through the truth of being to the Supreme Truth of God. This had the effect of clarifying the coherent structure of theology and of showing that theological concepts are formed and theological statements are made rightly only when they point beyond themselves to the Truth of God to which they are indebted as their Source. But it also has the effect of showing that, while all theological concepts and statements are inadequate, for God infinitely transcends all our thought and speech of him, nevertheless they are not for that reason necessarily false, for their truth as concepts and statements does not rest in themselves but in him to whom they refer. Expressed the other way round, Anselm showed that since God makes his own supreme Truth the objective ground of our knowledge of him he thereby confers relativity upon it. Thus theological inquiry and humility go hand in hand.³⁷

Torrance's dialogue with Anselm will prove to be crucial when we turn our attention to what Torrance means by the term "truth" in a subsequent chapter. We shall leave him now to consider the next example of *kataphysic* thinkers.

Kierkegaard, particularly in his *Philosophical Fragments*, is yet another example of someone who resisted the constraints of formal logic.³⁸ "Once again we

36 *R&ST*, 88. See also *T&C*, 277-278.

37 *R&ST*, 89.

38 *R&ST*, 89-90. See also *T&C*, 278-279.

have a thinker who rejected the patterns of formal argument and engaged in an open-structured movement of thought which, judged from the perspective of logic, represents no more than a set of fragments."³⁹ Kierkegaard was one of the first major philosophers who recognized the incredible importance of taking *time* into account in our knowledge of God.

But what really gripped Kierkegaard and forced him to come to terms with [time] was the fact that in the Incarnation “absolute” truth moved into time in Jesus Christ and became “historical fact,” which implies that we cannot know the truth except in a dynamic way involving a temporal or historical relation to it.⁴⁰

It is this kind of thinking that Torrance claims was taken up by James Clerk Maxwell in his dynamical interpretation of the electromagnetic field. This abandonment of attempting to think from a center of absolute rest by Clerk Maxwell is interpreted by Torrance as an example of scientists taking the same kind of step in science that thinkers like the ones just considered took in the field of Christian theology, setting the stage for the advances of people like Albert Einstein.⁴¹

What, for Torrance, are the alternatives to thinking *kata physin*?

After considering this idiosyncratic list of thinkers who represent the kind of epistemological engagement that Torrance thinks should be the norm, the question must be asked, "Are there any viable alternatives to Torrance's principle of *kata physin*?"

When Torrance describes authentic knowledge as knowledge of a thing according to that thing's nature, especially with its implicit claim that we do *not* properly know a thing when we know it according to something other than its nature, it is hard to see how this might be controversial. It might seem like nothing more than a truism. However, Torrance realizes that this has not been the only way people have

39 *R&ST*, 89.

40 *R&ST*, 90.

41 *R&ST*, 90-91.

approached knowledge. There are several epistemological approaches that Torrance feels undermine knowledge according to the nature of a thing.

Is dualism a problem?

The first and most dominant epistemological concern for Torrance is what he believes to be the distorting influence of dualistic ways of thinking. There are a variety of dualisms that have been developed throughout history that Torrance believes to be damaging to authentic knowledge and interpretation of the world. Speaking of the problem of dualism, though not by name, Torrance writes, "From time to time there have arisen in the course of human culture ways of thinking in which aspects of reality that are naturally integrated have been torn apart from each other, with damaging effect in different areas of knowledge."⁴²

It would seem that Torrance's major concern with the effects of dualistic ways of thinking is their tendency to separate what Torrance believes are unified and integrated. Whether this separation is between the heavens and the earth (or between the sensible and the intelligible), how a thing appears to us and what it is in itself, or between the knowing subject and the object of their knowledge dualisms, for Torrance, drive a wedge between different facets of an integrated whole.

Torrance might argue that there is no reason, *a priori*, to assume that there must be such dualisms in our approach to the world and so their imposition is a falsification of reality itself. Regardless of what weight such arguments might have, the issue seems to go deeper. In order for knowledge according to the nature of reality to necessarily imply a non-dualist or unitary approach, there must also be a basic conviction about the ultimate nature of the universe; that reality does, in fact, have this unitary character. We shall return to the issues surrounding these so-called "ultimate beliefs" in the next chapter.

At the moment, we must ask if it is possible to give an account for why *Torrance* thinks that knowing things according to their nature implies a rejection of dualistic ways of thinking. As we shall see below, when Torrance argues for the inadequacy of dualistic ways of thinking, he does not do so by arguing on the basis of

42 *MC*, 1.

general human experience or some kind of secular philosophy. He argues deliberately and concretely from the standpoint of Christian faith. Though Torrance's radical commitment to unitary ways of thinking is not, in itself, distinctly religious and can thus be useful in self-consciously secular fields, such as the philosophy of science, it is clear that he feels driven to such a position because of distinctly religious, indeed distinctly *Christian*, convictions. If we begin, as Torrance does, by taking our cue about the nature of reality from God's self-revelation in Jesus Christ, it would seem that Torrance's anti-dualistic stance is justified.

Torrance's affirmation of *kataphysic* thinking, as exemplified by the great thinkers discussed above is, in part, rooted in the rejection of *a priori* judgments regarding what a thing is or must be. The moment it is suggested that Torrance's rejection of dualism is the result of his Christian convictions, one must ask whether his anti-dualistic position is not a judgment *a priori*, the very kind of judgment that he opposes so strongly. It might be argued that Torrance's Christian convictions prevented him from fully understanding dualistic claims about the universe and our knowledge of it and so prevented him from appropriately discerning the relation of dualism to authentic knowledge.

Torrance, it would seem, would reject the accusation that his condemnation of dualism is *a priori*. Such an accusation might seem plausible if Christian convictions have universally and uniformly led Christians to radically anti-dualist positions, but this has not been the case. Not only does Torrance see dualistic tendencies alive and well in the contemporary church,⁴³ he has made a careful study of the intellectual trends that were current in the early church. Indeed, one might view his entire monograph, *The Trinitarian Faith*,⁴⁴ as a detailed exposition of how the various dualisms inherent in what have come to be known as the Christological and Trinitarian heresies are destructive to the most basic claims of the gospel. It seems that Torrance can be defended against the charge of condemning dualism *a priori* because it is not initially clear that basic Christian convictions are not compatible with dualistic approaches to knowledge, as is manifest by the many attempts to explain Christian faith within a

43 *R&ET*, 15-17.

44 *TF*.

dualistic framework such as we find in Arianism or Sabellianism,⁴⁵ and that it is only when it is seen how dualism undermines those Christian convictions in the actual unfolding of history that one can say with confidence that one cannot have knowledge of God in a dualistic framework and so, as a Christian, such frameworks must be rejected.

As has already been mentioned, Torrance's opposition to dualism is rooted in his Christian convictions. While such anti-dualistic commitments can have effects far beyond the field of Christian theology, it is because of their incompatibility with Torrance's basic understanding of Christian faith, expressed in the phrase "What [Jesus Christ] is toward us He is eternally and antecedently in Himself, but what He is in Himself He is toward us within our life in space and time" that Torrance comes to reject dualism wherever he finds it. It would seem to be an accurate reconstruction of Torrance's general anti-dualistic stance to say that, however plausible dualistic ways of thinking may appear in fields outside of Christian theology, they are revealed to be utterly unacceptable *within* that field and so must be rejected, by Christians, in *every* field.

The issues of cosmological dualism seem to lend themselves to a more picturesque description than others. Torrance invites us to envisage three ways to consider the relation "between the divine and earthly realms."⁴⁶

Picture in your mind the three ways in which two hemispheres may be related to one another: (1) as adjacent to one another but with a clear gap between them; (2) as touching one another tangentially; and (3) as intersecting one another or overlapping with one another. (1) and (2) presuppose a dualist framework of thought, whereas (3) rejects dualism in favor of interactionism.⁴⁷

Within the context of the early church, dualistic presuppositions were given expression in the sharp differentiation between the *kosmos aisthetos* and the *kosmos noetos*, the

45 *TF*, 115, 273-276.

46 *PCT*, 51-52.

47 *PCT*, 51.

world of sensible experiences and the world of intelligible reality.⁴⁸ Reflecting on the nature of such a separation, Torrance writes, "Pushed to its extreme point the *chorismos* [separation] between the *kosmos aisthetos* and the *kosmos noetos* means that the signs, words, statements, images, and conceptions arising within the world have only a this-worldly reference."⁴⁹

Torrance saw this kind of destructive dualism at work in Arian interpretations of Christian faith.

On the other hand, if God and the world are separated, as in the Arian scheme of things, and if the *cosmos noetos* and the *cosmos aisthetos* are disjoined from one another, then theology in the strict and proper sense is impossible, and there can be only mythology. Mythology is possible only on the axiomatic assumption of a radical dichotomy or *chorismos* between God and the world, for then our attempts to think of God are only *epinoetic* acts grounded in our own this-worldly self-knowledge and projected into God across the great gulf between us. But when that kind of gulf is eliminated by the condescension of the living and loving God who interacts with our world and human existence, and becomes incarnate in Jesus Christ, then a *dianoetic* way of thinking is possible, in which our thoughts, while remaining fully human, nevertheless repose upon the reality of God himself and are determined by his hypostatic self-communication to us in this world.⁵⁰

To put Torrance's conviction surrounding the problems of a cosmological dualism for Christian faith in other words we might say that if it is indeed true that, in Jesus Christ, God has crossed the alleged divide between the intelligible and the sensible and come to meet with us, such a dualism would falsify the Christian claim that, in Christ, we may come face to face with God. As such, cosmological dualism deprives Christianity the ability to think *theologically* and it is left only with the ability to think *mythologically*.⁵¹

48 *DM*, 45.

49 *DM*, 158. See also 159, 188-190.

50 *DM*, 203-204.

51 *TF*, 133-134. See also *DM*, 264; *G&R*, 45-46; *PCT*, 49-50; *TS*, 329.

The problem of cosmological dualism extends beyond the Trinitarian heresies. Torrance also finds that Christological positions condemned as heretical tend to flow from a tacit assumption of a cosmological dualism. In such a case, Christ is considered either "from above," in which case he is truly part of the intelligible world and not part of the sensible world, or "from below," in which case the opposite is true. Torrance considers these two approaches as being fundamentally the same, since they flow from the same dualistic tendencies, and classifies all such Christologies as either "docetic" or "ebionite," respectively.⁵²

A further concern over cosmological dualism is that Torrance feels it is linked in some way with the development of traditional natural theology. "It is rather curious that natural theology seems to have flourished only in times when a cosmological dualism dominated thought and to have partaken of that dualism."⁵³ It is important to note that the very thing that does so much to separate Christ from our world of space-time, and so eliminate the primary way that Christians can come to know God would also seem to be responsible for the attempt to know God through another, entirely different, way.

Another dualism that Torrance finds destructive to authentic knowledge is what he calls "the Kantian idea that we cannot know things in themselves or in their internal relations, but only in their external relations as they appear to us."⁵⁴

There are several ways in which Torrance finds this Kantian dualism to be problematic. A dualism of this sort can have dramatic consequences for Biblical interpretation.

By cutting out any possibility of immediate apprehension of rational or intelligible elements in any field of investigation, dualism limits the theological component in biblical knowledge to what is logically derived from observations or appearances...This means, for example, that it is impossible for us ever to know anything of Jesus Christ as he is in himself, for we are restricted to Jesus as he appeared to his

52 On the issue of docetic and ebionite Christology, see especially *TF*, 111-113. See also *DM*, 35; *R&ET*, 58-59; *G&G*, 124; *CDG*, 114-115.

53 *R&ST*, 37.

54 *G&G*, 28.

contemporaries - and indeed to the impression he made upon them as it is mediated through the structures of their consciousness, by which they made him an "object" of their faith and knowledge.⁵⁵

As Torrance understands it, approaching the Biblical text within the context of a Kantian dualism will necessarily place the reader in a position where they are at least two stages removed from the actual revelation of God through Christ. The Biblical authors cannot bear witness to Christ as he is in himself, but only as he appeared to them. Further, the reader can never know what the Biblical text is communicating in itself but only as it appears to them. Such would, for Torrance, eliminate any authority of the scriptural witness.

The fact that Kantian dualism is, for Torrance, antithetical to Christian faith is made clear when it is noted that the phrase we have cited as a kind of summary statement of Torrance's conception of Christian faith is worded in such a way that stands starkly against such a dualism. One cannot believe that "what [Jesus Christ] is toward us He is eternally and antecedently in Himself, but what He is in Himself He is toward us within our life in space and time" and yet affirm that we can only know a thing as it appears to us as opposed to what it is in itself.

Torrance does not limit himself only to theological reasons for rejecting Kantian dualism. Scientific practice, as he understands it, is also overturning its influence as it was manifest, according to Torrance, in people like Ernst Mach.⁵⁶

Science has been shedding its abstractive character, in which, through a predominantly observationalist approach, it tended to tear the surface patterns of things away from their objective ground in reality, as though we could have no knowledge of things in themselves or in their internal relations, but only in their appearances to us...But now all that is being cut back, as - in sheer faithfulness to things as they actually are in themselves - science is concerned to understand the surface patterns of things in the light of the natural coherences in which they are actually embedded, and it therefore operates with the indissoluble unity of form

55 *G&G*, 8-9.

56 *CT&SC*, 21; *T&C*, 272-273; *G&G*, 34-35, 42-43.

and being, or of theoretical and empirical elements in human knowledge.⁵⁷

Torrance's opposition to Cartesian dualism is somewhat more complicated than other forms of dualistic thought. The reason for this is that it is somewhat difficult to pin Torrance down on precisely what he *means* by Cartesian dualism. Traditionally, Cartesian dualism is the sharp differentiation between the mind and the body. Torrance certainly uses the term in precisely this way from time to time.⁵⁸ However, he more often uses the term "Cartesian dualism" to describe a radical break between subject and object,⁵⁹ though he also seems to see this as implying a radical break between phenomenal events and their alleged "meaning."⁶⁰

There is no point in Torrance's writing where he fleshes out the relations between these three meanings of the term, but it seems possible to provide something of an account of how they *might* be linked. In a definition of "dualism," Torrance considers "a dualism between the mind and the body," which certainly seems like the usual understanding of Cartesian dualism, and describes it as a situation "in which a physical and mental substance are conceived as either interacting with one another or as running a parallel course without affecting one another."⁶¹

It seems reasonable to suggest that a sharp separation between the mind and body could result in the kind of subject-object dualism which Torrance sets himself up against if one could say that, under dualist considerations, it is the mind that is the knowing subject as detached and abstracted from the body, unlike what we find in someone like Michael Polanyi, with whom Torrance was in significant agreement. Unpacking this further, it would mean that a separation between physical and mental substances within the human person, when generalized, is a separation between the mind/subject and the physical/object.

The connection between the dualism between mind and body and that between meaning and phenomena might be something along these lines. If a dualistic way of

57 *G&G*, 10-11.

58 *T&C*, 156.

59 *R&ST*, 15, 56-57, 72; *T&C*, 13-14; *TS*, 306.

60 *T&C*, 156.

61 *BS&CL*, 136.

viewing the human person locates things such as "intention" and "meaning" within the mental side of the dualism as opposed to the physical side, it would not take much to extend this conviction to the rest of experience. If the "meaning" of human actions cannot be understood in light of physical states and actions, or vice versa, why should one not conclude that the actions of other humans are similarly separable from their "meaning." Once this step is taken, why should one not conclude that "meaning" does not require accompanying phenomena and phenomena are inherently devoid of meaning, completing the dualism?

It should be repeated that this kind of analysis or exposition of the connections between these different uses of the phrase "Cartesian dualism," is not found in Torrance's writings. To a certain degree, it is of little consequence whether such connections can be entirely justified with reference to historical development. Torrance was far more interested in general tendencies, intellectual trends, and unspoken philosophical presuppositions than specific instances of them. Additionally, for the purposes of this thesis, it is not crucial that Torrance connected his concepts in this way, since he clearly opposes all three interpretations of the phrase. It is, however, important that these ambiguities in Torrance's presentation be brought out for the reader who may not be sensitive to the fact that his use of the term is somewhat non-standard.

The form of Cartesian dualism that Torrance opposes most consistently and vehemently is the sharp separation between subject and object. As this is the subject of chapter three where the issues at stake are explored at length, we shall pass over Torrance's problems with it briefly, with a pithy statement of what Torrance feels are its problems.

Whenever we operate, as we have been tempted to do regularly in post-Cartesian thought, with a subject/object relation in which the object is regarded as standing opposed to the subject, and therefore with an impersonal model of thought, we become trapped in detached, objectivist relations to what is other than ourselves. Thus the very model of thought which we use inevitably tends to exclude the place of

personal agency in our knowing and in the nature of what we seek to know.⁶²

It seems strange that Torrance did not make much of the problems that Christian theology, as he understood it, has with a mind-body dualism, especially when the theological controversy in which the issue arose for the church, Apollinarianism, was a major issue in Nicene theology and was even a topic upon which Torrance wrote, though perhaps not as often as on some other issues found in the Nicene theologians. Torrance summarizes a fairly long exposition of the consequences of Apollinarianism for Christian worship.

In allowing no room for the mental and moral life of Jesus as man and in denying to him authentic human agency in his saving work, it left no place for the vicarious role of the human soul and mind and will of Jesus in the reconciling “exchange” of like for like in the redemption of man. And by destroying his representative capacity, it had no place for his priesthood or human mediation in our worship of the Father, and by the same token it took away the ground for any worship of God with our human minds. A mutilated humanity in Christ could not but result in a mutilated Christian worship of God.⁶³

In spite of all these problems that arise in Christology when a mind-body dualism is not rejected it seems, to the best of my knowledge, that Torrance never explicitly connects the two. However, if it is appropriate to make this connection, that to affirm a mind-body dualism is catastrophic to Christian faith, it would certainly be in substantive agreement with Torrance's rejection of other dualisms. Regardless of how plausible such ways of thinking may seem outside of Christian theology, they are contraindicated by the most basic of Christian convictions and so, according to Torrance, if one is to think philosophically as a Christian, they must be rejected.

62 *R&ST*, 132-133.

63 *TReconcil*, 150. See also "The Reconciliation of Mind: A Theological Meditation upon the Teaching of St. Paul," in *Theology in the Service of the Church: Essays in Honor of Thomas W. Gillespie*. (Grand Rapids, Mich: W. B. Eerdmans Pub., 2000), 198-200.

After considering several dualisms and Torrance's rejection of them, one might be tempted to conclude that Torrance simply believes all forms of dualism to be problematic. We have already discussed some of the inadequacies of this charge to the degree to which it is equivalent with the charge that Torrance's rejection of dualism is a decision made *a priori*. However, there are ways of thinking that some might consider dualistic that are not only considered appropriate by Torrance but are even *demand*ed by Christian faith. The relation between God and the world, for example, is just such an instance.

The rejection of radical dualism, however, must not be taken to imply the advocacy of any oneness or even any proportion between God and the world, but rather the rejection of a deistic disjunction between them. God's interaction with the world He has made maintains a proper dualism between them.⁶⁴

The problem here is not the significant differentiation between God and the world since Torrance has no interest in defending views such as pantheism or panentheism. Rather, the problem arises when the difference between God and the world hardens, so to speak, into a conviction that God is *unable* to interact with the world that God has created. Torrance's rejection of dualism, again, is not an *a priori* position, but a careful response to reality as he understands it.

Torrance's rejection of dualism is so sustained and vigorous that it is not surprising that there are some, even among those sympathetic to his position, who might wonder if he "doth protest too much," and actually harbor dualistic tendencies. John Douglas Morrison, in his monograph, *Knowledge of the Self-Revealing God in the Thought of Thomas Forsyth Torrance*, suggests precisely this.

In fact, [Torrance] seems to open himself to the very charge of 'dualism' that he levels against others. If God is utterly different, if the *Logos* of God is radically different from created *logos* and historicity then what of unitariness and interrelation and real knowledge of God arising out of creation and redemption. Has he not either left Jesus Christ behind (in his true, real humanity) or made Christ/Word beyond history and human

64 *ST&I*, 71.

apprehension, given the fact that he speaks of the Truth as utterly transcendent and beyond all creatureliness, yet somehow apprehensible. A real “leap” of the “quantum” variety must occur given the fact that for Torrance Truth is not to be found in linguistic truthfulness itself.⁶⁵

There are a few misunderstandings evident in Morrison's critique. First, it would seem that Torrance would hesitate to speak of real knowledge of God "arising" out of creation and redemption. Surely Torrance would not want to deny that creation and redemption are conditions of real human knowledge of God since such knowledge could not occur in humans if there had been no creation or redemption. Indeed, for Torrance revelation, and thus real knowledge of God, cannot be separated from reconciliation.⁶⁶ However, to speak of knowledge as "arising" seems to connote a process of gaining knowledge of God that is more automatic or mechanistic than Torrance's thinking would allow.

A second problem with Morrison's treatment is that, when he claims that "a real 'leap' of the 'quantum' variety must occur *given the fact* that for Torrance Truth is not to be found in linguistic truthfulness itself,"⁶⁷ he implies that Torrance's *real* problem is his refusal to locate Truth primarily in the truthfulness of statements, as if an appeal to an inerrant Bible would solve Torrance's alleged dualistic problems.⁶⁸ In point of fact, such an appeal would solve nothing. If the gap between the uncreated *Logos* of God and the created *logos* of humanity cannot be crossed in the person of Christ, how can we believe that it has been crossed in a *text*?

The most significant problem with this charge of dualism is that Morrison has misunderstood the epistemological significance of the Incarnation for Torrance.

The Incarnation involves a hypostatic union not only between the Word of God and the word of man, the Rationality of God and the rationality

65 John D. Morrison, *Knowledge of the Self-Revealing God in the Thought of Thomas Forsyth Torrance*. (New York: Peter Lang, 1997), 270.

66 See chapters 1 and 2 in *MC*.

67 My emphasis.

68 The fact that Torrance would seem to resist such an appeal to biblical inerrancy lies in his conviction that, since Christ *is* the truth in his own person, we are not free to treat the scriptures as if they were true in the same sense. *R&ET*, 124.

of man, but between the uncreated Truth of God and the created truth of this world which God has made and to which we belong. Hence in Jesus Christ we have to reckon with one who is God's ultimate Truth and our contingent truth in the indivisible oneness of his personal Being, and therefore with one in whom God's ultimate Truth has become humanly articulate and communicable in words and truths within the reciprocities and intelligibilities of our contingent existence in space and time. Thus when our contingent statements refer away from themselves to the Truth of God as it is in Jesus Christ, *they do not have to bridge the infinite difference* between the creature and the Creator in order to terminate upon that Truth, for they may refer to it in its incarnate Reality, and insofar as they are true they may actually terminate upon that incarnate Reality and thus upon the Truth of God Almighty himself.⁶⁹

For Torrance, the dualism that Morrison posits is not just overcome *by* Christ but *in* Christ. It is a *real* hypostatic union that overcomes the separation. In spite of the radical difference between the Divine and human *logoi*, there is no separation between the two within the Incarnate Christ. We are therefore led to conclude that, if Torrance is guilty of dualistic tendencies within his own theology, it is not where Morrison thinks he has found them.

How is Positivism perceived as undermining kataphysic knowledge?

A frequent theme in Torrance's writing is that he considers positivism to be one of the greatest dangers to our knowledge of reality. However, looking at how the term is actually used leads to somewhat less clarity than one would like.⁷⁰ On this topic, we may turn to the glossary which Torrance wrote to accompany an edited (by Torrance) volume of essays exploring the implications of the thought of Michael Polanyi for faith and life. He provides a lengthy explanation of what he understands by positivism.

69 *R&ET*, 125, my emphasis.

70 For some passages where we get hints regarding particular aspects that Torrance dislikes about positivism see *CDG*, 47; *D&CO*, 95-96; *R&ST*, 21-22, 54; *T&C*, 200-201; *G&G*, 81-82, "TR," 183.

Positivism - the view which denies that we can know more than tangible external facts. It seeks to purify science from metaphysics by avoiding any ontological reference of knowledge to reality, and aims at the achievement of strict detachment and impersonality by discarding all unprovable beliefs as arbitrary personal manifestations. According to the positivist view of knowledge scientific theories must not go beyond sense experience by affirming anything that cannot be experimentally observed or tested, so that whenever an empirical observation turns up that conflicts with it, a theory is deemed to be falsified and must be dropped immediately. Scientific theories are ultimately only useful mental constructs or sets of useful conventions for the handling of observational data, or devices like maps, time-tables or telephone directories with reference to which we may record events and compute their future course in our observations. Theories of this kind deny any claim to inherent rationality, so that, as Polanyi argues, they lack any real persuasive power. In common with empiricism and phenomenism, positivism offers a complete mechanico-causal interpretation of man and human affairs which disintegrates all rational grounds for human convictions and actions. Moreover, it offers a mechanistic account of the human mind, in identifying the mind with the physio-logical mechanism of the brain, and thereby denatures man and denies him any capacity for independent thought.⁷¹

Torrance's explanation of positivism begins with a fairly straightforward account that might just as easily come from someone who endorses the program. Toward the end, Torrance's distaste for positivism enters into his explanation, drawing on the similar distaste that Polanyi had for the view.

There are several places where Torrance's understanding of positivism clashes with his own epistemological position. He is concerned that a view that, *a priori*, rejects any knowledge that goes beyond tangible and external facts or sense perception, will never be able to know things in accordance to their own nature, since he does not

71 *BS&CL*, 142-143.

believe that the nature of a thing can be reduced to its manifestation in sensibly perceptible ways. It is, in some ways, functionally Kantian in the sense that it restricts knowledge only to things as they appear to us rather than things as they are in themselves which, as we have already seen, is not compatible with knowledge in Torrance's view. It is less clear that Torrance's explanation is sufficient to account for why positivism necessarily implies a mechanico-causal interpretation of reality. Such would require a reductionistic and naturalistic philosophical project which, while certainly compatible with positivism as portrayed by Torrance, is not a logical consequence of the other aspects of positivistic thinking mentioned by him.

Occasionally, Torrance will refer to positivism as having been defeated within the natural sciences.⁷² He is not alone in this view; it has been rejected by philosophers as different as Karl Popper,⁷³ Roy Bhaskar,⁷⁴ and Bas Van Fraassen.⁷⁵ This widespread agreement sheds light on Torrance's attack on positivism in a two major ways.

First it shows that, though Torrance chooses to be almost casually dismissive of positivism rather than arguing against it, he is not simply ignoring a view with which he disagrees. Positivism has indeed been rejected, not only by practicing scientists, who are Torrance's preferred sources for his philosophy of science,⁷⁶ but by professional philosophers of science. Problems within the positivistic program itself⁷⁷ as well as increasing pressure from philosophers in the tradition associated with Thomas S. Kuhn have made the radical rejection of a theoretical component to knowledge untenable.

72 "TR," 175; *T&C*, 65.

73 Karl R. Popper, *Conjectures and Refutations: The Growth of Scientific Knowledge*. Fourth (Revised) ed. (Frome and London: Butler & Tanner Limited, 1976), 21-22. Popper claimed that the kind of empiricism put forward by some positivists was "quite unsatisfactory."

74 "My subsidiary aim is thus to show once-and-for-all why no return to positivism is possible." Roy Bhaskar, *A Realist Theory of Science*. 3rd ed. (London: Verso, 2008), 8.

75 "Logical positivism, especially, even if one is quite charitable about what counts as a development rather than a change of position, had a rather spectacular crash." Bas C. Van Fraassen, *The Scientific Image*. (Oxford: Oxford University Press, 1980), 2.

76 *Ground and Grammar of Theology*, Lecture 2 Q&A. Grace Communion International, <http://gcity.net/download/MiscVid/TorranceGrammar-Tape2-QA.mp3>. Accessed March 18, 2014.

77 As revealed by the development from Carnap through Popper to Lakatos.

There is a second consequence of this consensus that positivism is no longer a viable philosophical position that must be taken with the utmost seriousness. Though we can say that, for all intents and purposes, positivism is dead, the impulse that gave rise to positivism in the first place is alive and well. The fall of positivism has not resulted in the fall of scientific anti-realism more generally. The fact that one of the most important anti-realist philosophers of science in recent decades, Bas Van Fraassen, can agree with Torrance that positivism is not viable, means that we must be prepared to examine the issue on a somewhat deeper level.

Van Fraassen's philosophical position, which goes by the name "constructive empiricism,"⁷⁸ is a form of scientific anti-realism that avoids some of the major problems that Torrance has with positivism. It would be hard to charge Van Fraassen with limiting knowledge to tangible, external facts as he seems to be relatively unconcerned with speaking of "knowledge" at all. He is far more interested in speaking of the grounds upon which we stand when we "accept" a scientific theory, which he claims is empirical adequacy at a particular moment in time rather than "truth."⁷⁹ Constructive Empiricism does not require the discarding of unprovable beliefs; indeed it relies upon them for Van Fraassen's view is that "scientific activity is one of construction rather than discovery."⁸⁰ Because of this, theories must necessarily go beyond sense experience.

Much more could be said regarding how Van Fraassen's scientific anti-realism is exempt from Torrance's critique of positivism and yet stands, at least in part, within the tradition flowing from it. The lesson we must learn from this example is that the philosophical background of the discussion between scientific realism and anti-realism is more nuanced than one who has read only Torrance's views on the subject might realize. This has some practical implications regarding Torrance's place in this discussion to which we shall return in chapter four.

78 Van Fraassen, *The Scientific Image*, 5.

79 Van Fraassen, *The Scientific Image*, 12.

80 Van Fraassen, *The Scientific Image*, 5.

What kind of reality is implied by *kata physin*?

As stated above, in order to insist that we have authentic knowledge only when we know something according to its nature there must be a reality that exists independently of the knower. We turn our attention now to what this reality ought to look like if Torrance's epistemological convictions are valid.

Though Torrance would claim that in both natural and theological science we investigate any particular reality according to its own nature, the distinction between the object of theological knowledge and the objects of our natural knowledge can become somewhat confusing, even in Torrance's own writing. For example, there is an instance where Torrance claims that our knowledge of God is different than our knowledge of natural objects because,

Natural objects, when we know them, *have to be* objects of our cognition - that is part of their determinate nature. This is not to deny that knowledge of them requires effort on our part, and indeed discovery. Even though we must engage in intuitive and discursive thought we do not discover God by our own efforts, and when we know Him He does not have to be an object of our cognition in the same way as in natural knowledge.⁸¹

What, precisely, does Torrance mean by this "have to be" that sets natural objects apart from the Divine Object? The specific expression that Torrance uses is unfortunate in that it seems to connote a kind of unreliability or capricious element in God's being.

What could Torrance mean by this? Does he simply mean that God always transcends our forms of thought and speech about him? This is hardly unique to theological knowledge, as Torrance points out several times within the same book.⁸² Does he mean nothing more than that we can gain knowledge of created being without having to let it disclose itself to us out of its own volition while we cannot do so with God? This might hold true when comparing theology with physics or chemistry, but there is certainly a parallel, *mutatis mutandis*, with fields such as psychology, where we

⁸¹ *TS*, 37.

⁸² This will also become more clear throughout the course of this work.

must take the actual self-disclosure of the subject into account.⁸³ Does Torrance intend to imply that, whereas God continually objects to being confined by our theoretical expressions, natural objects have no analogous resistance? This again would seem to be inconsistent with Torrance's larger concerns.

We get a sense that these interpretations are *not* what Torrance intends when we examine the footnote to the above passage that reads, "By 'natural knowledge' is meant here knowledge of natural phenomena." When we realize that the difference is not so much, as the main text implies, knowledge of natural *objects* as knowledge of natural *phenomena*, then the problems become less difficult, for there is a marked difference between how we come to know natural phenomena and how we come to know God.

Though there is a sense in which both the objects of natural and theological science are *given* in the sense that they are truly *objects* and not merely constructs of our own subjectivity,⁸⁴ there is a crucial difference in this given-ness. In spite of all the sweat and hard work that goes into natural scientific inquiry, there is a sense in which the objects are given for the *taking*. We are limited in our ability to investigate them only by the difficulties inherent in accessing them, whether it be a matter of traveling to a particular part of the world (such as in biology or zoology), developing the right equipment (as in astronomy or particle physics), or acquiring a way of looking at the problem in order to make sense of it (as in relativity theory).

We might also say that the Object of theological science is given for human knowledge. However, we must conceive of God as being given for the *receiving* rather than taking. Indeed, this giving must also be understood as God's free self-giving, for God is not coerced. God is not such that we can storm his kingdom and demand revelation of him in the way that we can with much of creation. Rather, we are at the mercy of God, and mercy is the correct word here, to reveal himself to us. At no point does God "have" to be the object of our knowledge as there is no point where we can make such a demand of him. God is eminently faithful to himself and we need not fear

83 Or even in knowing other persons. See *T&C*, 198, for Torrance's appropriation of the distinction between voluntary and involuntary objects.

84 Torrance makes this point in the main text immediate before the previously quoted material. The term "given" must not be understood as implying "bare facts" or "theory-free data."

that a genuine insight into the reality of God will prove fundamentally false, though it might need to be significantly transformed, as in other sciences. What is at stake is the source or agent of knowledge. In this it is always *God* who graciously gives himself to be known by us in Christ and through the Spirit.

Here we are making explicit a distinction that seems to be implicit in Torrance's thought. Though there is, to my knowledge, no text in Torrance's work which states this, it seems that the comparative accessibility of the objects of natural science as compared to that of theological science might find theological rooting in Genesis 1:28, where humanity is given authority over creation, while no parallel authority over God is given.

Is there a structure to reality?⁸⁵

Once an external reality is affirmed, the question arises as to whether this reality has a structure and, if so, what that structure is. Torrance believes there *is* a structure to reality, that it is characterized by what he calls "inherent intelligibility" or "inner logic," which is to play a considerable role in our understanding of it.⁸⁶

For Torrance, the structure of reality is revealed to us in the fact that, in our scientific engagement with reality, we have had to develop a stratified series of sciences, each of which engaging with different levels of reality, attempting to explain phenomena ranging from the purely physical, through the organismic to the sociological.⁸⁷ As such, the conclusion that reality is stratified is made *a posteriori*, after considering the necessity, in practice, of a plurality of natural sciences.

Each science examines this stratified reality at different levels, with their methodological concerns being driven by the unique nature of the object of each science. In physics, for example, we have to do with purely physical reality, largely amenable to mathematical and deterministic description. In biology, we have to do with

⁸⁵ See, *inter alia*, *TS*, 106-116.

⁸⁶ Torrance also use the phrase "inherent rationality," though this is less common. For Torrance's use of such phrases, see *CT&SC*, 67-68; *G&R*, 202-203; *R&ST*, 7-8, 77-78, 85-86; *TS*, 262-263; *G&G*, 117; *T&C*, 273-274.

⁸⁷ *T&C*, 208-209. See also *CT&SC*, 37-38; *D&CO*, 20.

living beings, which react differently to experiment than inanimate reality, which naturally exist in communities and environments that cannot be artificially closed off for scientific purposes without changing their very nature. In psychology, we are dealing with human persons who have minds. In addition to whatever we can discover through external experimentation, we must also take account of the fact that human subjects can speak to us and can tell us about themselves.

The objection might be made that Torrance is simply reading an accidental fact of history, that we happen to have a series of sciences, into a fact about reality, that the reality studied by those sciences is similarly stratified. Why should the organization of our sciences necessarily be rooted in how things are independently of them? Is it not equally defensible that our natural sciences are what they are because our minds have *imposed* that kind of structure upon reality?⁸⁸ How is it that Torrance can be confident that the structure of our sciences is the consequence of a structured reality and not that our conception of a structured reality is the result of our development of stratified sciences?

On one level, this conviction is an "ultimate belief" in the broad sense described in the next chapter, where it is a decision made that, from one point of view seems entirely arbitrary but, from another point of view, is made under the impress of reality itself. However, some more justification can be offered.

The affirmation that our epistemology is undergirded by a logically prior ontology can be seen as rooted in Christian convictions. According to Torrance, we rise up from our evangelical and doxological experience to a doctrine of the Evangelical Trinity and posit the existence of an Ontological Trinity and claim that these two are, in fact, one and the same.⁸⁹ That is to say, the Trinity that actually *exists* is not something other than the Trinity we encounter in Christ and through the Spirit.⁹⁰ It is true that one might object that there is no logical bridge between our theories and reality and so we cannot use epistemology to justify ontological claims.⁹¹ However, as it seems the

88 *T&C*, 7, 38.

89 A fuller account of how this happens will be provided in chapter 5.

90 The connection between the economic Trinity and the ontological Trinity can be found in *DM*, 213; *G&G*, 158, 168; *CDG*, 7, 83-84, 90-91, 109, 136, 254.

91 Indeed, Torrance is aware of this. See *TS*, 184, though Torrance uses the term "purely theoretical

entirety of Torrance's book, *The Trinitarian Faith*, is concerned to demonstrate, if our doctrine of the Evangelical Trinity does not arise from a previously existing Ontological Trinity, Christian faith collapses to the ground.⁹² It seems that the reasoning from the stratification of our sciences to the stratification of reality is parallel. If reality is not stratified, it renders the stratification of our sciences unintelligible.

There is another argument, rooted in common sense and thus simpler if not as rigorous, that could be raised. Whatever one wishes to say at the level of abstract epistemology, we actually *behave* as though reality is stratified since we do not attempt, generally, to reduce one science to another. One might object, as has been done by various anti-realist critiques of scientific realism, that we cannot assume that entities exist simply because our theories posit them.⁹³ This is certainly true. However, if there is no relation at all between our theories and reality, the entire scientific endeavor collapses to the ground. This is not to say that, if reality does not agree entirely with our *current theoretical formulations*, science is doomed, but that, if our theories are not arising from *something* independent, science is doomed.⁹⁴

This kind of stratification is precisely what we would expect to find according to Torrance's epistemology. Scientific inquiry generates particular sciences whenever it is applied to a new object or subject of study. This includes the science generated when the "nature" under investigation is the living God, revealed in our spatio-temporal world in Jesus of Nazareth: Christian theology.⁹⁵

bridge" here.

92 See *TF* and *CDG*, the entirety of which are largely concerned with this and related topics.

93 See the two essays in Christopher Hitchcock (ed), *Contemporary Debates in Philosophy of Science*. (Malden, MA: Blackwell), 2004. Jarrett, Leplin, "A Theory's Predictive Success can Warrant Belief in the Unobservable Entities it Postulates," 117-132 and André Kukla and Joel Walmsley, "A Theory's Predictive Success does not Warrant Belief in the Unobservable Entities it Postulates," 133-148.

94 Indeed, it is the conviction that our theories are rooted in an independent reality beyond themselves that not only allows for theory change over time, but demands it. More on this in chapter 5.

95 It is because of its devotion to its proper object that Torrance argues for theology being a science alongside the other sciences. *TS*, xvii. See also *G&R*, 114; *KB*, 211; *Treconstr*, 268-269; *TS*, xiii-xiv, 22-23.

The different levels of reality and the sciences can be both distinct yet intimately related. When writing about this, Torrance uses concepts that we find in the philosophy of Michael Polanyi. Though there are distinctions between the sciences, there are "boundary conditions" where two sciences, and the realities they study, come up against each other. At such boundary conditions, a level of reality can influence others to a greater or lesser degree.⁹⁶ Cross-level influence takes place in two ways. Just as a "lower" level of reality, by being what it is, marks off theoretical possibilities as being impossible in fact, action at a higher level can make lower levels behave in unexpected ways. It is precisely because cross-level interaction is a matter of this "dual control" (any level is influenced by activity at both "higher" and "lower" levels) that our science of engineering is possible.

One example of how dual control can be made manifest is with an airplane. Air molecules when left alone will seldom, if ever, spontaneously generate the conditions necessary for sustained heavier-than-air flight. The laws of aerodynamics do not prohibit such flight which is clear from the fact that such flight actually occurs, but such conditions are unlikely to arise purely on the molecular level, due to the second law of thermodynamics. However, we are consistently able to *create* such conditions, not by manipulating the molecular system directly and as such, but by engineering a wing whose shape is such that the desired pressure systems result. This feat of engineering at a higher level was not done by ignoring the levels below it, but precisely by taking them very seriously into account. All the engineering in the world cannot make an unsuitable material suitable or change the conditions under which flight is possible. What we are able to do, though, is influence lower levels by creative advancement on higher levels.

When speaking of reality as a stratified series of levels, it begs the question as to whether there is one level that is the single most "basic" in every meaningful sense of the word. In other words, does there exist a single level of reality such that every other level of reality can be understood and interpreted as nothing more than as a function of

⁹⁶ References in Torrance to boundary conditions and dual control can be found in *CT&SC*, 38; *D&CO*, 102-103, 127; *R&ET*, 37-39, 73-74; *R&ST*, 92-93; *ST&I*, 84; *T&C*, 136, 142, 146-148, 179-180, 208-209; *ST&R*, 188-190. Michael Polanyi, *The Tacit Dimension*. (Magnolia, MA: Smith, 1983), 35-36.

that level? Torrance's definition of reductionism is that it is "the belief that everything can be explained by recourse to a single simpler principle, or that all knowledge can be reduced to a single level of explanatory connections."⁹⁷

Torrance is opposed to reductionistic ways of thought, regardless of whether one is speaking of reducing one level of reality to another or reducing one conceptual level to another.⁹⁸ He follows up his above definition with the following, "More generally, reductionism is the fallacy of redefining one set of entities and their relations, instead of treating the latter as a limiting case of the former."⁹⁹ Though there may be considerable overlap between "adjacent" levels, one can never be reduced to another without remainder. Torrance cites Oppenheimer with approval.

Every science has its own language...Everything the chemist observes and describes can be talked about in terms of atomic mechanics, and most of it at least can be understood. Yet no one suggests that, in dealing with the complex chemical forms which are of biological interest, the language of atomic physics would be helpful. Rather it would tend to obscure the great regularities of biochemistry, as the dynamic description of gas would obscure its thermodynamic behaviour.¹⁰⁰

The fact that attempting to reduce "higher" sciences to "lower" ones obscures the regularities of the "higher" science implies that the order manifest at these different levels are of different kinds. Torrance often speaks of this kind of relation by saying that the levels are "open upward but not reducible downward."¹⁰¹

Every time Torrance mentions reductionist ways of thinking, he is critical of it. However, it should be noted that there is a sense in which the sciences are reducible to one another, but we must be clear that there is more than one way to speak of one field being "reducible" to another. Roy Bhaskar, a philosopher of science who was a later contemporary of Torrance, distinguishes between three different ways we can speak of

97 *BS&CL*, 144.

98 See *CT&SC*, 15-17; *T&C*, 264-265 for the former; *CDG*, 86; *G&G*, 36; *R&ET*, 45, for the latter.

99 *BS&CL*, 144.

100 *TS*, 111.

101 *D&CO*, 20; *T&C*, 177, 208; *CDG*, 86; *ST&R*, 188.

one science or field being reducible to another.¹⁰² First, the lower level is the "basis" of the higher, out of which it arises and is bounded. A second sense is that the higher level can be "explained" in terms of the lower level. Lastly, the higher level can be "predicted" by the lower level. Bhaskar clearly affirms the possibility of the first sense, in that we can say that chemistry is "reducible" to physics inasmuch as the object of chemistry could not exist without the object of physics and that chemistry cannot break the laws of physics. However, he absolutely rejects the third sense, as one cannot predict what will happen chemically by an analysis of the relevant laws of physics any more than one can predict how a game of cricket will unfold simply by analyzing the rules of the game.¹⁰³ It would seem that Torrance is largely in agreement with Bhaskar on this point. When he speaks against reductionism, it is clearly of the third kind. His appropriation of Polanyi's distinction between "higher" and "lower" levels seems to imply that he would, in fact, affirm the first, and perhaps even the second, variety of reductionism. Torrance did not distinguish between these different kinds of reductionism. This is, in part, because these distinctions had not yet been widely made; Bhaskar was attempting to examine an under-analyzed concept. When most writers in the twentieth century speak of reductionism, it is in its third form which both Torrance and Bhaskar reject. However, it should be noted that Torrance's blanket condemnation of "reductionism" tends to obscure the distinction made explicit in Bhaskar. As such, Torrance can be seen as making the distinction between the sciences a bit "harder" than may be warranted.

A note on Torrance's use of "science"

Torrance often speaks of science as if it were neatly divided up into clearly demarcated eras. He speaks casually about "Newtonian" science and "post-Einsteinian"

102 Bhaskar, *A Realist Theory of Science*, 114-116.

103 Bhaskar, *A Realist Theory of Science*, 112. Torrance will occasionally draw on the Polanyian insight that we cannot determine the purpose of a machine merely by physico-chemical analysis but must have a distinct science of engineering to do this. See *CT&SC*, 15-17; *R&ET*, 37-39; *T&C*, 146-148; *ST&R*, 188-190. Polanyi, *The Tacit Dimension*, 38-41.

science. Within the realm of physics, it is hard to doubt that Newton and Einstein have had a significant enough impact so as to make such descriptions fairly reasonable within a narrow field. However, Torrance's frequent reference to favorite scientists such as Einstein and Clerk Maxwell could raise the question as to whether Torrance is really in dialogue with "science" or perhaps only, to a significant degree, with a handful of his favorite scientists.

It must first be noted that Torrance's preferred dialogue partner within the scientific disciplines is physics. This is evident from Torrance's frequent references to physics and the works of physicists and the noticeable shortage of references to other scientific fields. This is particularly interesting because Torrance claims that theology, due to the nature of its subject matter, has more in common with other scientific fields than physics, especially classical physics. At one point, Torrance suggests that theology's inability to fit into the kind of logic that characterizes classical physics makes it similar to "quantum physics and biology," which also resist that kind of logical description.¹⁰⁴

However, in spite of this resonance, Torrance does not engage with either quantum physics or biology in any significant depth. Not only are references to sciences outside of physics rare in Torrance's writing, he occasionally makes comments to the effect that other sciences have not made the kind of advances he finds in relativity physics and are therefore to be seen as somewhat behind the times. Torrance laments this failure of scientists to make the same kind of step in biology as relativity physicists have made in their own field.

Modern biology has yet to achieve a 'break-through' in this direction comparable with that in physics, but when it does, the organized space-time structures of the biological field should supply historical science and theological science with more apt analogues than those which are not available in physics.¹⁰⁵

104 *TS*, 271-272.

105 *ST&I*, 84-85. Torrance believes that this advance has been obstructed by reductionistic ways of thinking. See *T&C*, 264-265 and *G&G*, 8-9.

Again, we read that Torrance wants to affirm a closer kinship between theology and biology than between theology and physics, but we do not see this conviction fleshed out in his writings.

Torrance's interaction with quantum physics is somewhat more complicated. Tapio Luoma points out that, while in early works like *Theological Science*, Torrance makes many references to quantum physics, “though never in a critical tone,” in later works like *Divine and Contingent Order*, he “applies consistent criticism to the Copehagen/Göttingen interpretation, accusing it of lapsing back into determinism.”¹⁰⁶ This shift is important as it connotes that Torrance, earlier in his career, felt that quantum physics was compatible with his theological perspective while later on came to believe that the mainstream of quantum physics was hostile to his views.¹⁰⁷ Luoma suggests that Torrance's “appreciation of Einstein” has tended to impede his ability to engage with quantum physicists who disagree with Einstein's interpretation of the field.¹⁰⁸

Torrance appropriates the insights of one more branch of science that it is important to note here. In Torrance's later works, we find periodic engagement with the field of non-equilibrium thermodynamics or the thermodynamics of open systems.¹⁰⁹ While such an engagement has profound implications, for Torrance, with regard to the kind of non-deterministic order that can characterize open systems, it must be noted that this is, once again, a branch of physics. Indeed, one might say that, when Torrance speaks of non-equilibrium thermodynamics, he is actually referring to the work of Ilya Prigogine, whom he mentions by name with some frequency.¹¹⁰ If this is so, and it seems that it is, we are left with Torrance, rather than extending his engagement with

106 Luoma, *Incarnation and Physics*, 67n.

107 Luoma, *Incarnation and Physics*, 67n.

108 Luoma, *Incarnation and Physics*, 67.

109 References to non-equilibrium thermodynamics, or the thermodynamics of open systems, can be found in *CT&SC*, 17; *D&CO*, 50; *T&C*, 185-188; *G&G*, 12-13, 141-143; *CFM*, 21-24, 99-100, 101-102; *PCT*, 69-70.

110 References to Prigogine in Torrance's writings can be found in *D&CO*, 50, 121; *T&C*, 186-187; *G&G*, 12-13, 141; *CFM*, 92, 99-100, 103, 152; *PCT*, 41-42, 69-70. Note there is a great deal of overlap between the lists of references to non-equilibrium thermodynamics and those to Prigogine.

the natural sciences by adding another branch of science, has merely extended his engagement by adding the work of another individual scientist with whom he finds resonance.

What shall we make of Torrance's selective use of modern science? A sympathetic reading of Torrance on this topic would emphasize that he was likely just trying to find and explore the relevant points of resonance between theology and science and that he should be applauded for this work. However, even if this is the case, it is not sufficient for Torrance to characterize his work as engaging with "science" as a whole or even with "post-Einsteinian science." Rather, Torrance's engagement is primarily with a handful of scientists who have done important work that reveal ways in which Torrance's theological vision is not only compatible with elements of modern science but has significant resonances with it. While this work is not unimportant and scientifically minded Christians may have much to celebrate in Torrance's work, one must be more careful than Torrance was and refrain from speaking so broadly of Torrance's appropriation of "science."

Above, we considered that Torrance's epistemology is not value-neutral. There are some conditions that must be taken into consideration in order for it to be intelligible. If Torrance's epistemology requires that we must believe certain things, those mentioned above were a belief in an external reality and the belief that we have some kind of epistemic access to that reality, it is important to examine the role of such convictions in our knowledge and how Torrance deals with them within the context of his epistemological concerns. It is to this topic that we turn in the next chapter.

2. Ultimate Beliefs

In the last chapter, it was argued that Torrance's epistemological conviction, that authentic knowledge is knowledge according to a thing's nature, is not value-neutral but is only intelligible if certain conditions hold; namely, that the object of knowledge exists and that we have epistemic access to it. This acknowledgement raises several questions. Is it possible to have epistemological convictions that do not rely, explicitly or implicitly, upon conditions of this kind? Do such conditions of knowledge invalidate a given epistemological position? If one grants the necessity of such conditions of knowledge, does this not open up the gates to substantial criticism? Before such questions can be addressed with regard to Torrance's position, a further point about his realist convictions must be articulated.

Torrance's realism, as opposed to empiricism or positivism, asserts that we may know more of reality than we encounter through our senses. This has several relevant implications, the most important of which at this point in our discussion is that knowledge cannot be reduced to sense-experience. Someone from an empiricist perspective might object to this and ask Torrance, "Where does this knowledge come from?"

In answer to this, it must be noted that Torrance believes that reality can bear upon us in a dynamic and holistic way that *involves* our senses but cannot be reduced to what we experience through them. In a moment of personal reflection in the preface to his major work, *Theological Science*, we get a glimpse into the kind of thing Torrance might be talking about within the context of his fundamental theological convictions.

I find the presence and being of God bearing upon my experience and thought so powerfully that I cannot but be convinced of His overwhelming reality and rationality. To doubt the existence of God would be an act of sheer irrationality, for it would mean that my reason had become unhinged from its bond with real being.¹

Here, Torrance is giving expression to a kind of knowledge that is empirical in one sense but not in another. It is clear that Torrance is speaking of God as experienceable,

¹ *TS*, xi.

for God can "bear upon" his experience in a powerful way. However, although Torrance articulates this in terms of *experience*, he does not do so in terms of *sense-data*.² What this means is that Torrance is implying that one can have experience that cannot be reduced to sense-data. The upshot of this in epistemological terms is that one cannot use sense-data as the exclusive means by which to verify or falsify certain epistemological claims.

Can we have presupposition-less knowledge?

For a theist to affirm that there are certain epistemological claims that can be neither verified nor falsified by sense-data is potentially controversial. To assert that claims about the existence and character of God are exempt from verification or falsification by sense-data is likely to sound to many ears like a double-standard that illustrates precisely why theistic belief is unreasonable.

Torrance is not positing a fundamental difference between the kind of knowledge we gain in the natural sciences and the kind of knowledge we gain in theological science. Instead, Torrance suggests that for all their differences, the natural and theological sciences are in the same epistemological situation, *mutatis mutandis*. Natural and theological science are both governed by what Torrance calls "ultimate beliefs" which are neither verifiable nor falsifiable, yet exert a controlling influence on scientific thinking.³

The controlling statements with which we operate in science are both unfalsifiable and unverifiable. They are statements which express what

2 John Wesley alludes to a notion of "spiritual senses." "Sermon 130: On Living without God." In *The Works of John Wesley*, edited by Outler, Albert C. Vol. 4, 168-176. (Nashville: Abingdon Press, 1987), §9-11, 172-173. It is important to note that Torrance uses "experience" to describe what happens when someone encounters an independently existing reality, whether divine or mundane. Within Torrance's writing, the term functions as stressing the accessibility of that external reality. In some contexts, Torrance uses the term "participation" in a similar way, though it must be noted that this term is used in a distinctly non-Platonic way.

3 *BS&CL*, 12.

we have called ultimate beliefs, beliefs without which there would be no science at all, beliefs which play a normative role in the gaining and developing of all scientific knowledge. Yet these ultimate beliefs are by their very nature irrefutable and unprovable. They are irrefutable and unprovable on two grounds: (1) because they have to be assumed in any attempt at rational proof or disproof; and (2) because they involve a relation of thought to being which cannot be put into logical or demonstrable form. Ultimate beliefs, then, are to be understood as expressing the fundamental commitment of the mind to reality, which rational knowledge presupposes and on which the reason relies in any authentic thrust toward the truth. Far from being irrational or non-rational, these ultimate beliefs have to do with the ontological reference of the reason to the nature and structure of things, which all explicit forms of reasoning are intended to serve, and without which they are blind and impotent. It is indeed not finally through formal reasoning that knowledge and understanding are advanced, but through the responsible commitment to reality in which our minds fall under its intelligible nature and power, and thereby gain the normative insights or ultimate beliefs which prompt and guide our inquiries, which enable us to interpret our experiences and observations, and which direct the reasoning operations of our inquiries to their true ends.⁴

For Torrance, it is impossible to get away from having ultimate beliefs at work in our scientific thinking. Even if one were to present one's knowledge in such a way that did not explicitly acknowledge the role of ultimate beliefs, they would be at work in the background, tacitly conditioning all other knowledge and significantly influencing which concepts are understood to be reasonable and which are not.

4 *T&C*, 194. Cf. *BS&CL*, 10.

Do ultimate beliefs necessarily invalidate knowledge based on them?

Once it is asserted that it is not possible to eliminate the role of ultimate beliefs in human knowledge, it must be asked whether the mere existence of ultimate beliefs necessarily invalidates knowledge that is gained under their influence. It must first be noted that, if the answer to this question is "yes," it would have a dire consequence. It would mean that no human has ever had knowledge, since no human knowledge is devoid of such ultimate beliefs. This is a conclusion that strikes at knowledge gained by the natural sciences as well as theological knowledge, as it has become increasingly clear that scientific knowledge does not exist in a conceptual vacuum, but exists within "paradigms."⁵

It is in a similar way that Torrance deals with the threat of skepticism. Torrance lays out some observations made by "critical philosophers"⁶ about how theology relates (or doesn't relate) statements to the being of God that must be taken seriously. In addition to taking the observations under consideration, he makes the following comment.

In regard to these observations it should be noted that they do not apply to theological statements only, that is, to the case where the referent is infinitely beyond the statement itself, but also to the basic statements of empirical science where the referent is an existent or a process and not an idea, that is, where it is quite another thing than the statement itself. If the critical observations are meant to demolish theology, they also demolish empirical science and lead to pure scepticism. If they are meant

5 The notion of a "paradigm" comes from Thomas S. Kuhn's incredibly influential *The Structure of Scientific Revolutions*. 3rd ed. (Chicago: University of Chicago Press, 1996), which has shaped a large portion of subsequent discourse on scientific knowledge. Even though elements of Kuhn's account of paradigms have been challenged in subsequent philosophy, the basic point relevant to this discussion is widely affirmed. The importance of viewing scientific knowledge against a conceptual background has also been noted, in various ways, by Duhem, Quine, Lakatos, Laudan, and others.

6 *TS*, 183. Torrance names Ayer and the early Wittgenstein in the footnotes.

to be sceptical, they involve a serious error, in presuming that thinking of a thing is identical with making actual contact with it.⁷

Torrance's point is that at least some of the arguments that might be marshaled against theology are faced with a choice: Frame the question in a way that is critical but neither destructive nor unanswerable from a theological perspective or destroy theology but at the price of destroying natural science as well. Indeed, even if one were to choose the latter option, such arguments for skepticism make some problematic assumptions. In these ways, theology is only in danger of being destroyed if the other sciences are as well.

Are ultimate beliefs philosophically neutral?

We are now at a crucial point in understanding the role of ultimate beliefs in Torrance's thought. We have considered already that ultimate beliefs are necessary for human knowledge in the sense that they cannot be eliminated. Additionally, if the mere existence of ultimate beliefs invalidates knowledge gained under their influence, then there is no such thing as knowledge. The question that presses upon us at this stage in our discussion is whether *all* would-be ultimate beliefs are equally appropriate.

Torrance does not believe that the descriptor "ultimate belief" can be applied arbitrarily to any conviction that one happens to not want to give up. In its more precise sense, ultimate beliefs are the beliefs that are objectively forced upon us by the fact that reality is what it is and not something else.⁸ That is to say, if a given conviction does not arise from the actual, ontological state of reality, it cannot properly be called an ultimate belief. If Torrance had said no more about ultimate beliefs, he would be open to the charge of evading the problem at hand. It is one thing to claim that some beliefs are forced upon us by reality itself and that there are no reasonable alternatives to them. It is quite another thing actually to provide some examples as to what might count as a truly *ultimate* belief. Torrance provides precisely this.

7 *TS*, 184.

8 *CFM*, 75.

Among ultimate beliefs of this kind we must put the existence or reality of the universe, and the order and intelligibility of the universe, together with the stability, constancy, and simplicity of that rational order. Along with the affirmation of these ultimate beliefs must surely go dependent beliefs or corollaries, such as the belief that we can apprehend, at least in some measure, and bring to theoretical expression that rational order, or belief in the validity of mathematical or logical reasoning, which we have to presuppose from beginning to end in all mathematical and logical operations. That is to say, along with ultimate belief in the intrinsic rationality and lawfulness of the universe goes our belief in rational and scientific thought, although this belief, properly held, admits of the limitations of our science.⁹

The practical upshot of this is that Torrance believes that the kind of beliefs upon which scientific inquiry relies are *ultimate* beliefs. This position is bolstered by an appeal to three Einsteinian aphorisms about "God:" "God does not play dice," "God does not wear his heart on his sleeve," and "God is deep but not devious."¹⁰ Torrance is well aware of the fact that Einstein was not a Christian and so is aware that it would be inappropriate to read a Christian conception of "God" into those statements.¹¹ However, though Torrance agrees that reality is such that we cannot seriously entertain any real alternatives to the regularity, contingent reality, and reliability of nature, we can nevertheless ask the question as to why things are *this* way rather than *another* way; that is, why reality has those characteristics instead of being chaotic, unreliable, or characterized by logico-causal necessity at every level. To this, Torrance suggests a distinctly theological interpretation: the universe was created by a God who gave the universe its own order distinct from - yet dependent upon - the divine order and who is fundamentally characterized by faithfulness.¹² For Torrance, this certainly seems consistent with the cosmological claims of Christian faith.

9 *T&C*, 202-203. Note that the two convictions which are required by Torrance's realism are included in this passage; one as a properly ultimate belief and the other as a "dependent belief."

10 See *T&C*, 250-259; *G&G*, 112-131.

11 *CT&SC*, 60-61.

12 *D&CO*.

It would seem that this could be considered a form of "natural theology." Torrance might suggest that this way of reasoning makes no claim to teach us anything concrete about God. It merely suggests that these ultimate beliefs, without which science could not even get off the ground, require a sufficient reason which, on balance, tends to favor the Christian notion of creation more than its alternatives.¹³

There are difficulties that arise when defining ultimate beliefs this way to which we shall turn our attention in a moment. It must be noted, however, that these problems are practical rather than theoretical. They are difficulties in working out the epistemological implications of ultimate beliefs and not difficulties in the concept of ultimate beliefs itself.

Can we know our ultimate beliefs with certainty?

If the only beliefs that are entirely appropriate for serving as conditions of our knowledge are the ones that are forced upon us by reality itself and that, outside of these ultimate beliefs, they exercise a distorting (though not necessarily falsifying) effect on our knowledge, then our epistemological problem is sorting out whether our beliefs are ultimate or whether they arise from somewhere other than reality itself.

Are we always able to know which of our beliefs are ultimate? What would be implied if it were asserted that we were? If we could always know precisely which beliefs are ultimate the epistemological challenges would be more straightforward. It is precisely because we cannot know this with the kind of certainty we would like that we are faced with epistemological difficulties surrounding ultimate beliefs. There are times when convictions we had hitherto considered to be certain are called into question.¹⁴

When the advance of knowledge reaches the point where really fundamental change is demanded of us, and profound epistemological

13 *G&G*, 105. See also *D&CO*, 9, 45-46; *T&C*, 29, 97-98; *G&G*, 70; *CFM*, 113. Whether Torrance is as hostile to natural theology as Karl Barth has been contested. However, Alister McGrath, among others, finds resonances with Torrance in such a way as to develop a revised natural theology. *A Scientific Theology, Vol. 2 - Reality*. (Edinburgh: T & T Clark, 2002), 279-286.

14 It is something of this kind that takes place when what had been considered mere "anomalies" within a Kuhnian "paradigm" begin to be suspected of being "counter-instances." *Structure of Scientific Revolutions*, 77-91.

decisions have to be made, then our ultimate beliefs are forced out into the open. That is to say, we reach the stage where we have to ask if the regulative principles with which we have been operating are really grounded in reality or not, whether our ultimate beliefs are really ultimate, or whether we have been operating with substitute-beliefs which have misled us. This is what happens when the normative principles with which we have been operating begin to show evidence of conflict with each other.¹⁵

We find ourselves in need of a term to describe beliefs that, up to a certain point, seemed like ultimate beliefs but have been revealed to be something else. Torrance provides just such a term. Such convictions are termed "penultimate beliefs."

What are penultimate beliefs?

As the term might suggest, penultimate beliefs bear a resemblance to ultimate beliefs but fall short of what it means to truly be an *ultimate* belief. Torrance distinguishes between ultimate and penultimate beliefs in this way. "A distinction should be drawn within our fundamental beliefs and their normative function in affecting our on-going scientific inquiries. This is a distinction between *ultimate beliefs*, for which we have no alternatives, and *penultimate beliefs*, for which we are faced with alternatives."¹⁶

What does Torrance think a choice between alternative penultimate beliefs looks like? Before we look at some concrete examples of this kind of choice let us consider, at length, Torrance's exposition of the importance of such decisions.

There are...beliefs which carry normative authority in our basic outlook upon things and thus exercise a regulative function in our scientific activity. I have called these beliefs penultimate, because we can hold them only by rejecting alternatives which can, it is claimed, be

¹⁵ *T&C*, 199-200.

¹⁶ *T&C*, 202.

'reasonably' held. In respect of these controlling beliefs, the context of our affirmation or choice of them is of particularly acute importance, for decision is demanded of us as a result of a conflict in our operative beliefs which is not logically resolvable: we have to choose one way or the other, and the way we actually choose excludes the alternative. We cannot balance these alternatives, for belief at this penultimate level is demanded of us by our ultimate belief in the nature of things. We have to make our decision to accept or reject these operative beliefs on the ground of whether they are epistemically correlated to the nature and structure of reality independent of our perceiving and conceiving. In the great scientific transition in outlook in which we are now caught up, such deep conflicts in beliefs have arisen that clarification and change in our regulative beliefs are unavoidable.¹⁷

The decisions one makes among alternative penultimate beliefs has enormous consequences. Two people proceeding with shared ultimate beliefs but divergent penultimate beliefs may end up generating two entirely different ways of understanding the world. One is reminded of the differences that emerge in geometry depending on whether one accepts Euclid's "parallel postulate" and, if not, which alternative is accepted.

Torrance explicitly names three choices that one must make in attempting to understand the universe. Ignoring or attempting to avoid making a choice between them does not make one more neutral and thus more authentically scientific. Rather, it condemns one to make an uncritical decision between them and it is when we are unaware of our controlling beliefs that we are most ensnared by them.¹⁸

These three choices are between "belief as to the dualist or non-dualist character of the universe,"¹⁹ "belief and disbelief in the singularity and uniqueness of the created universe,"²⁰ and "belief in the primacy of the visible and tangible over the invisible and

17 *T&C*, 203.

18 *CT&SC*, 13.

19 *T&C*, 204-206.

20 *T&C*, 206-208.

intangible."²¹ Ancient Greek thought would have believed that the universe was dualistic, that the universe was not singular or unique, and in the primacy of the invisible and intangible. Newtonian thought would have agreed on the first two decisions but prioritized the visible and tangible. Post-Einsteinian science, as portrayed by Torrance, would have a non-dualist universe which is singular and unique and a conviction that the invisible and intangible is primary over the visible and tangible.²² The fact that, for all their similarities, these three understandings of the universe can be so different is a illustration of what is at stake in choosing between alternative penultimate beliefs.

Torrance thinks that the fact that there are genuine alternatives at this important level is significant. "The very possibility of alternatives, even in the regulative beliefs with which we operate in science, is itself grounded in the belief that the universe might have been other than it is, that it could well have been different, and it is not a necessary universe."²³

We now have Torrance affirming two distinct but related notions: ultimate beliefs which are forced upon us by the very nature of reality and thus have no alternatives, and penultimate beliefs which exercise a controlling influence on all our thinking, yet are not *required* by reality in the same sense as ultimate beliefs. The question that rises to the surface in light of this distinction is, how are we to distinguish between properly ultimate beliefs and penultimate ones? If we posit an ontological

21 *T&C*, 208-212.

22 Torrance is uneven in the evidence he provides for the character of post-Einsteinian science. He is weakest on the claim that post-Einsteinian science is non-dualist in character, for he simply asserts that it is (*T&C*, 205). However, he gives stronger support for his other two claims. Torrance sees "the universally recognized discovery of the 2.7°K background microwave radiation," as turning opinion decisively in favor of a "big bang" cosmology against a "steady state" one (*T&C*, 206-207). Torrance claims that any idea that the visible and tangible is to be seen as primary over the invisible and intangible "suffered a severe set-back (*a*) by the discovery that is the space-time metrical field, which is inherently invisible and profoundly objective, that controls all observable objects in our experience; and (*b*) by the disclosure of the multi-leveled structure in our scientific knowledge of it" (*T&C*, 208).

23 *T&C*, 203.

distinction between ultimate and penultimate beliefs, do we have epistemological criteria such that we can tell the difference between the two?

Torrance does not analyze this issue in any depth. It is his general tendency simply to state that there are some beliefs that are ultimate and some that are penultimate, either treating the difference as self-evident or leaving it to the reader to decide in each case which is which. Torrance leaves much unsaid that could and should be said about ultimate and penultimate beliefs. We shall attempt to fill this lacuna.

One weakness in Torrance's presentation is that he is a bit quick to dismiss alternatives to what he has called ultimate beliefs. For example, it is perfectly possible to conceive of the reality of the world as being nothing more than a fantasy. While this view is not likely to be taken seriously among the ranks of practicing scientists, it is still a question whose answer is not as obvious as Torrance would make it seem. The fact that there can be sincere discussions within epistemology about the "problem" of other minds, where we can never be utterly certain that minds other than our own exist, for they might all be merely projections of our own mind, shows that there is a sense in which there are alternatives to what Torrance claims are ultimate beliefs.

It might be that, while solipsism is a theoretical alternative to the belief in a world external to the mind, it is not a *practical* one in the sense that people do not actually *behave* as though they believe that the world they experience is nothing more than a construction of their mind. If Torrance believes that we can make a decision between two alternative penultimate beliefs, even in trivial cases such as this,²⁴ based on practical commitments, which it would seem he does, it has implications for the problem in the philosophy of science of the underdetermination of theory by evidence.

While Torrance can be careful to distinguish between ultimate and penultimate beliefs when speaking explicitly on the topic, there are places where these concepts are clearly in the background where it is not always so unambiguous. It seems as though Torrance only spoke of penultimate beliefs by name in one essay.²⁵ They crop up again

24 It is trivial because, though there is a "problem" of other minds, the existence of other minds is not seriously denied by anyone, to my knowledge. It is a problem, not because there is a credible movement to deny their existence but because a strictly empiricist epistemology would seem to imply that we cannot know that other minds exist.

25 "Ultimate Beliefs and the Scientific Revolution," in *T&C*, 191-214.

and again, however, though without the clarity in that essay and under different terms. Torrance sometimes uses the term, "framework of thought" as a shorthand expression for "set of ultimate and penultimate beliefs."²⁶ It is important to note, however, that when Torrance uses "ultimate beliefs" in an abstract sense, that is, without stating the concrete beliefs he is referring to, it often bears the meaning of "framework of thought" without concern to distinguish which beliefs may be ultimate or penultimate.²⁷

An example of such a use of the term occurs when Torrance is explaining Einstein's vision of science overcoming the dualism between empirical and theoretical elements. Under such circumstances, he writes, "the scientist must learn to operate under the control of his [sic] ultimate beliefs and intuitive insights, but of course not without readiness to have them constantly put to the test in the course of his scientific reasoning which must always end with experience as well as begin with it."²⁸

It may be that this passage can be read as unambiguous, in which case Torrance is simply advocating that scientists never assume that their conceptual framework is settled and always allow it to be tested. On this reading, there is no reason to *necessarily* assume that Torrance is referring to penultimate as well as ultimate beliefs. Do we not put our ultimate beliefs to the test by our experience as much as our penultimate ones? This may be so, but it reveals a very important relation between Torrance's metaphysical claims and his practical advice. While Torrance believes that ultimate beliefs, beliefs forced upon us by ontological necessity, *exist* and can actually be held by human beings, we may never be able to *know*, in the sense of "know with utter certainty," that we are not operating under some misunderstanding as to which of our beliefs are penultimate and which are truly ultimate.

It might seem that this advice belies Torrance's belief in the reality and attainability of ultimate beliefs. If we can never know for sure whether we hold ultimate beliefs to which there are no alternatives, how can we know that they even exist? Without going into too much detail, as such would be the subject of an independent paper, the roots of this conviction seem to be Christological. Torrance believes that, as

26 This usage can be found in *BS&CL*, 19; *T&C*, xii, 81.

27 Such usage can be found in *TReconstr*, 143; *ST&R*, 16-17; *T&C*, 196.

28 *CT&SC*, 57.

the *word* that inheres in the very being of God become flesh, Christ is not merely historical fact but historical fact which provides its own interpretation.²⁹ Though the interpretations of individual theologians or even of the church may not infallibly grasp Christ's self-interpretation, it does not change the fact that there actually is a *correct* doctrine of God, one unique understanding of God demanded by the reality of God himself, namely the one believed by Christ in his vicarious humanity. If there exists a humanly attainable, as it was indeed attained in Christ, entirely true and appropriate understanding of God, it stands to reason, *a fortiori*, that such is true of created reality.

Merely affirming that there is a difference between ultimate and penultimate beliefs is not sufficient. We must be able to discern, at least in *some* cases, whether we are dealing with ultimate or penultimate beliefs. It is not possible to know, *a priori*, whether a particular belief is ultimate in any instance. If a belief is ultimate, this is not something that we may come to know through an *argument*. Such beliefs can be justified only by the sheer force of reality itself. As such, there is no authority above or beyond reality which can declare our beliefs to be ultimate. To paraphrase Imre Lakatos who was discussing a slightly different, though related, aspect of epistemology, reality is not able to shout "Yes!" to our would-be ultimate beliefs but only "Inconsistent!"³⁰

It would seem that beliefs might be shown, *a priori*, to be penultimate after the method discussed above, where an explanation which is empirically equivalent though theoretically quite different is dreamed up, regardless of how implausible it may seem to the scientific mind. However, this would make *all* beliefs penultimate, for such alternatives can *always* be devised. The metaphysical value of Torrance's ultimate beliefs is that some alternatives which seem possible to the abstract reason are not possible as a matter of fact.³¹

29 *TS*, 148.

30 Imre Lakatos, "Falsification and the Methodology of Scientific Research Programmes." In *Criticism and the Growth of Knowledge: Proceedings of the International Colloquium in the Philosophy of Science, London, 1965*, Volume 4, edited by Lakatos, Imre and Alan Musgrave, 91-196. (Cambridge: Cambridge University Press, 1970), 130.

31 For this kind of reasoning see *G&R*, 145; *R&ET*, 88-89; *ST&I*, 66; *T&C*, 269; *TS*, 341-342; *G&G*, 108-109; *CDG*, 23-24.

If we are interested in actually making progress in science, whether natural or theological, the kind of information we get from *a priori* speculation is not particularly helpful. At best we can question whether a belief is truly ultimate but, since we *never* have a guarantee that any particular belief is ultimate, this is a trivial epistemological gain. More interesting is what we can learn *a posteriori* about our beliefs.

While ultimate beliefs can be neither verified nor falsified, and penultimate beliefs cannot be verified, for they are not true in addition to the other problems surrounding verification, they *can* be falsified on the grounds of reality itself. This can be seen in various revolutions in scientific knowledge. A belief might seem to be demanded by reality itself; let us take the absolute space and time of classical mechanics as an example. It is simple, fruitful, and seemed demanded by the scientific insistence upon objectivity. However, there can come a time when, however helpful the concept had been, it is replaced by one that does a better job of explaining a wider range of phenomena. When this happens, there is no guarantee that the new belief is ultimate but we become quite sure that the previous one was *not* ultimate.

What are some parallels to Torrance's ultimate beliefs in secular philosophy of science?

This way of thinking is not without parallel in secular philosophy of science contemporary with Torrance's career. In many important ways, Torrance is not saying anything fundamentally different on this topic than Thomas Kuhn in his *Structure of Scientific Revolutions*. Kuhn provides a more detailed account of how the scientific community becomes increasingly dissatisfied with the old "paradigm" and moves toward a phase of "revolutionary science,"³² but the two men are agreed that we spend most of our time operating within a particular "framework of thought" (Torrance) or "paradigm" (Kuhn), that these frameworks or paradigms are unavoidable, that they do not falsify knowledge gained within them, and that they occasionally get overturned by

32 Kuhn, *Structure of Scientific Revolutions*, 66-91.

others deemed more adequate but with no guarantee that the same will not happen to this new framework or paradigm.

While Torrance's notion of a framework of thought has some striking resonances with Kuhnian paradigms, there are some very interesting similarities between Torrance's approach to basic questions about reality and that of philosopher of science Roy Bhaskar.³³

Bhaskar's name is associated with a movement called "Critical Realism," stemming from a combining of two terms coined by Bhaskar to describe the positions articulated in two of his early monographs. "Transcendental Realism," developed in his work, *A Realist Theory of Science*, and "Critical Naturalism," developed in his work, *The Possibility of Naturalism*.³⁴ His work has proved influential among some of those engaged in the theology-science discussion, such as Alister McGrath, who described Bhaskar's work as helping to provide the "breakthrough" in his own understanding of realism.³⁵

It must be noted that the term "Critical Realism" has been used by a variety of thinkers representing different trajectories of thought.³⁶ It has also been used by others in the theology-science discussion, such as Ian Barbour, who introduced the term into the field, as well as Arthur Peacocke and John Polkinghorne, who followed him in this usage.³⁷

33 This discussion will be drawing on Bhaskar's "Transcendental Realism" as expounded in his book, *A Realist Theory of Science*. 3rd ed. (London: Verso, 2008), rather than on the later developments of "Critical Naturalism" or the further development under the name "Critical Realism." The reasons are three-fold. First, It is here where Bhaskar's realism is laid out most clearly. Second, Bhaskar develops his theory in this work most closely in dialogue with the natural sciences as opposed to the social sciences of some of his later writing, which makes it closer to Torrance's context. Thirdly, Bhaskar once said in an interview, "Really the whole of my work has stemmed from this essay [A Realist Theory of Science] into ontology." Roy Bhaskar and Christopher Norris. "Roy Bhaskar Interviewed." Accessed 08/13, 2013, http://www.criticalrealism.com/archive/rbhaskar_rbi.html.

34 Roy Bhaskar, *The Possibility of Naturalism*. 3rd ed. (London: Routledge, 1998).

35 McGrath, *A Scientific Theology*, Vol. 2, xvi.

36 For a discussion of the different ways the term has been used, see Andreas Losch. "On the Origins of Critical Realism." *Theology and Science* 7, no.1 (2009): 85-106.

37 Kees Van Kooten Niekerk. "A Critical Realist Perspective on the Dialogue between Theology and

While a discussion of Torrance's place in the larger theology-science discussion would certainly be of great interest, the scope of this thesis demands a much more modest aim here. Torrance's thought will not be brought into dialogue with "Critical Realism" in general, but with Bhaskar in particular, in part to ensure that such reflections are concrete in nature. However, the reader should be aware of the fact that "Critical Realism" has developed into a tradition, even multiple traditions, of its own.

In Torrance's writing, when specific ultimate beliefs, and here we are using the term in its more general sense of "framework of thought," are brought up, it is frequently for the purpose of asserting convictions, arising from what Torrance believes are distinctly Christian sources, without which science would not be possible. Using these beliefs as premises, Torrance concludes that certain positions, such as positivism, are untenable.

Bhaskar is every bit as determined as Torrance to reveal the inadequacy of positivism to account for scientific knowledge.³⁸ However, he approaches the issue from precisely the opposite direction: by analyzing scientific *practice* and concluding that the basic beliefs behind positivism are inadequate to account for it. To accomplish this, Bhaskar employs a transcendental argument. "The status of propositions in ontology may thus be described by the following formula: It is not necessary that science occurs. But given that it does, it is necessary that the world is a certain way."³⁹ This approach has the practical advantage of rooting the validity of the question whether his theoretical account of reality is appropriate in the validity of scientific practice. Since it is scientific activity that the philosophy of science is attempting to explain and account for, this is a wise move. Indeed, inasmuch as it is an expression of allowing the object of study to have authority over the one who knows it and to stand in judgment over our theoretical formulations, it is a fitting expression of an attempt at *kataphysic* philosophy of science.

Science." in *Rethinking Theology and Science: Six Models for the Current Dialogue*, edited by Gregersen, Niels Henrik and J. Wentzel Van Huyssteen, (Grand Rapids, MI: William B. Eerdmans Publishing Company, 1998), 52.

38 Bhaskar, *Realist Theory of Science*, 8.

39 Bhaskar, *Realist Theory of Science*, 29.

Specifically, Bhaskar begins with the scientific procedure of conducting experiments to learn about reality. He points out that the positivist understanding of science requires an understanding of natural laws going back to Hume, where such laws are constant conjunctions of events where, whenever A happens, B also happens.⁴⁰ Bhaskar argues that, outside of fields such as astronomy, we almost never have a constant conjunction of events as described by our natural laws outside of the controlled environment of the experiment. As it happens, experimental practice presupposes that the mechanisms or tendencies (Bhaskar's terms) which are at work in the closed environment of the laboratory are also at work outside of that environment where the constant conjunction does not attain.⁴¹ Bhaskar concludes that, if science is to be meaningful at all, it must presuppose that there exist mechanisms or tendencies that are more ontologically basic than phenomena which give rise to those phenomena.⁴² In short, if science is to be intelligible at all, it must be realist in the sense that scientific knowledge cannot be reduced to an organization of sense-data. To put this in a Torrancean idiom, scientific behavior is not value-neutral, but is the outflow of particular ultimate beliefs.

In spite of the fact that there is much to suggest that there is no closer parallel in secular philosophy of science to the realism advocated by Torrance than that put forward by Bhaskar, especially in his *Realist Theory of Science*, there are some notable differences between the two approaches, though it should be stated that these differences do not detract from the profound resonances that exist.

While Torrance writes self-consciously as a Christian theologian, Bhaskar writes from a secular perspective, with no reference to Christian notions of God or even a "higher power." This likely explains, at least in part, why Torrance is so quick to speak in fiduciary terms whereas Bhaskar elects to confine himself to an analysis of praxis. Related to this is Torrance's clear preference to discuss the relation between theory and practice in accordance with the *ordo essendi*. That is to say, Torrance prefers to begin with the reality of God and the creation, then transition to the kinds of beliefs we hold

40 Bhaskar, *Realist Theory of Science*, 12.

41 Bhaskar, *Realist Theory of Science*, 33, 65, 103.

42 Bhaskar, *Realist Theory of Science*, 20, 25, 46-47, 202.

as a result of those realities and then to how we behave in light of those things. By contrast, Bhaskar's approach could be viewed as proceeding according to the *ordo cognoscendi*. He attempts to account for how we actually come to know the characteristics of reality by beginning with our behavior and then attempting to discern what beliefs such behavior implies.

In spite of the clear sympathies that a committed Christian might have with Torrance's approach, it seems that the fact that he nowhere provides an analysis of scientific behavior will make his presentation less appealing to those who are not already accustomed to speaking in fiduciary terms. Conversely, for all of its value, Bhaskar's analysis is not likely to be seen as going far enough by many Christians. Positivism was able to avoid speaking of metaphysical concepts such as God because it claimed to deal only with what was accountable in terms of sense-data. The question, "How did things get to be this way," never arose because there was never a claim that things *are* "this way," but only that our experiences are thus and so. Once Bhaskar opens up the way for metaphysical reflection by arguing for the real existence of mechanisms or tendencies, it seems necessary to point out that Bhaskar's transcendental arguments ought not to stop there, but be applied to his own position. That is to say, we must not only ask the question, "If science is intelligible, what must be true about the world," but go on to ask, "If the world is this way, how did it come to have these characteristics?" Torrance might respond that the only position that can support such a view is Christianity.⁴³

Bhaskar's approach can thus serve as a helpful, indeed necessary, extension of Torrance's. Torrance has a tendency to declare that post-Einsteinian science has left problematic philosophical baggage behind and has moved in a more robustly realist direction.⁴⁴ He may very well be correct in this, but there is a certain weakness. Why

43 Indeed, Torrance made a habit of claiming that it was no accident that modern science arose in Christian Europe rather than in other cultures with highly developed mathematics, as he believes that distinctly Christian notions such as the contingency yet reality and reliability of the world were necessary for such a discipline to arise, though it might spread anywhere once developed. See *T&C*, 218-219; *CFM*, viii-ix; *R&ST*, 198-199; *D&CO*, 91-92; *TReconstr*, 15.

44 For example, Torrance will speak of Einstein as having "destroyed" a dualistic way of thinking or a particular approach to science. See *PCT*, 42, 63.

should the opinions of authorities within the scientific community be more convincing than philosophical arguments? It is well known that Einstein's authority as a philosopher of science, for example, was not always followed in his later life as he was seen as naïvely holding on to determinism in the face of what were interpreted as phenomena that defied deterministic description.⁴⁵ Bhaskar's approach would be a helpful addition to Torrance's thought because it depends less on what secular or atheistic scientists and philosophers are inclined to doubt, the non-empirical convictions of theologians and scientists, and more on what such people are more likely to take seriously: the experimental practice of science.

The difference of approach between Torrance and Bhaskar reveals a weakness in Torrance's presentation of ultimate beliefs. It might be argued that Torrance approaches philosophy of science and ultimate beliefs “from above” while Bhaskar considers them “from below.” From one perspective, this may seem like nothing more than a harmless difference of approach. However, given that Torrance wants to take his cue for how we know created reality from his convictions as to how we come to know God in and through Christ, it would seem that there is an inconsistency.

Torrance rejects the dualism inherent in ebionite and docetic Christologies and insists that we cannot oppose a Christology from above with one from below but that we must approach Christ “from below and from above at the same time, for it is in the light of what we learn from below that we appreciate what we derives from above, and in the light of what derive from above that we really understand what we learn from below. In a faithful and rigorously theological approach, therefore, we apprehend both together.”⁴⁶

In the light of this difference of approach, if the parallel between theological and natural science is as strong as Torrance clearly thinks it is, then a preference for approaching creation “from above” while not also providing a robust account of our knowledge of creation “from below” is not merely a difference in emphasis, it is a

45 Max Born, "Einstein's Statistical Theories." In *Albert Einstein: Philosopher-Scientist*, edited by Schilpp, Paul Arthur. Vol. 7, 163-177. (La Salle, Ill.: Open Court, 1970), 166. Torrance cites Pauli as evidence that Einstein was not a determinist but a *realist*. See *D&CO*, 13-14; *T&C*, 250.

46 *CDG*, 114. The concern of approaching Christ “from above” or “from below” is related to Torrance's criticism of ebionite and docetic Christologies. See *TF*, 112-115.

genuine oversight which, if not filled in, would endanger Torrance's larger claims that theology and natural science are engaged in essentially the same kind of movement of thought.

It might be said that Bhaskar and Torrance are approaching the same or similar concerns from different directions. The fact that each of these men was writing to a different audience that had different values goes a long way in explaining their differences in presentation. However, it seems that Torrance's affirmation of ultimate beliefs which play such an utterly crucial role in the larger tapestry of his philosophy of science, might be clarified and strengthened by taking advantage of a dialogue with Bhaskar. Torrance's position not only has *space* for Bhaskar's position, it actually *requires* it, or something like it, in order for Torrance to be internally consistent with his larger Christological and methodological concerns.

Is Torrance a Fideist?

The strong place given in Torrance's thought to the controlling influence of ultimate beliefs in theological reflection might make one suspicious that, especially as a theologian, Torrance might be a fideist. "Fideism' is the name given to that school of thought which [asserts] that faith is in some sense independent of, if not outright adversarial toward, reason."⁴⁷ Within the Western tradition since the Enlightenment, where reason has played such a primary role, it is easy to see how Torrance might be open to the charge of fideism, especially from those who believe that faith and reason are, of necessity, in opposition to one another.

Before we explore whether Torrance's position is a fideistic one, it is appropriate to consider what is at stake in the charge of fideism. After all, it is hardly surprising that theologians might be convinced, by the very nature of their discipline, that faith ought to have a prominent place in their thinking. In a different time and place, to reject

47 Richard Amesbury, "Fideism," The Stanford Encyclopedia of Philosophy (Winter 2012 Edition), Edward N. Zalta (ed.), Accessed on 28 January, 2014
<http://plato.stanford.edu/archives/win2012/entries/fideism>.

reason in favor of faith might be seen as a positive thing. However, in post-Enlightenment Western culture, it is seen as a serious threat to intellectual honesty. It is an accusation that the evidence of one's senses and mind are to be marginalized because of a commitment to things deemed to be inconsistent with such evidence.

Andrew Purves suggests that "There is a kind of scientific theological fideism operating [in Torrance's theology] that is the result of the nature of God's revealing and saving act in Jesus Christ."⁴⁸ This is seen as being the result of "the relation of theology to the other branches of knowledge and Torrance's refusal to engage an independent epistemological justification."⁴⁹ Neither Purves nor Torrance seem particularly bothered by this element of fideism,⁵⁰ but it must be taken seriously and, if possible, demonstrate that it is not an epistemically harmful fideism. As will be made clear, it would seem that Torrance is able to escape any damaging accusation of fideism.

In his well-known essay "Reason and Belief in God," Alvin Plantinga suggests an objection that might be raised against a theist who claimed that their belief in God is "properly basic" and thus above evidentialist critique.

If belief in God is properly basic, why cannot *just any* belief be properly basic? Could we not say the same for any bizarre aberration we can think of: What about voodoo or astrology? What about the belief that the Great Pumpkin returns every Halloween? Could I properly take *that* as basic?...If we say that belief in God is properly basic, will we not be committed to holding that just anything, or nearly anything, can properly be taken as basic, thus throwing wide the gates to irrationalism and superstition?⁵¹

It should be noted that Plantinga is not in any meaningful dialogue with Torrance at this point. We simply take his expression of the objection as it has become somewhat classic

48 Andrew Purves, "The Christology of Thomas F. Torrance." In *The Promise of Trinitarian Theology: Theologians in Dialogue with T. F. Torrance*, edited by Colyer, Elmer M., 51-80: (Rowman & Littlefield, 2001), 72.

49 Andrew Purves, "The Christology of Thomas F. Torrance," 72.

50 Andrew Purves, "The Christology of Thomas F. Torrance," 72-73. "TFTR," 309-310.

51 Alvin Plantinga, "Reason and Belief in God." In *The Analytic Theist*, edited by Sennett, James F., 102-161. (Grand Rapids, MI: W. B. Eerdmans, 1998), 149.

and it is easy to see how such an objection might be raised against Torrance's ultimate beliefs, charging that such beliefs are a sign of fideism.

Torrance's position seems to imply both a negative and a positive response to any charge of fideism. Negatively, it is important to say that Torrance would argue that theology is not in a unique epistemological position; it could be argued that even the natural sciences, such as physics, are open to this charge, for they operate with ultimate beliefs that are accepted uncritically, such as belief in the reality and reliability of the external world. It might be said that the only difference between distinctly theistic ultimate beliefs and those demanded by the natural sciences is that there are comparatively few people who reject the latter in Western culture today, though it should always be remembered that there have been many throughout history who have done so.⁵²

If the charge of fideism is sustainable against Torrance's theology, then it would seem also to be sustainable against physics. However, it is unlikely that this is something that someone who is unhappy with fideism is likely to do. One of the implications of the "Great Pumpkin Objection" is that, if belief in God is to be distinguished from "bizarre aberrations" such as voodoo and astrology it must provide a justification for such a belief based on something other than the belief itself. However, this is revealed to be either an inappropriate demand or something that would as soon eliminate physics as a field of reasonable study as theology.

To ask for theology to give an account for its field on grounds that do not arise on the basis of that field itself is no more reasonable than to ask for physics to give an account of its field on independent philosophical grounds. There are no such independent grounds; physics is justified by the nature of its object of study and nothing else. If physicists are not expected to be deterred by the arguments of solipsists, it would stand that neither ought theologians to be sidetracked because someone else denies the possibility of their field.

The positive response to the charge of fideism arises from Torrance's basic epistemological convictions. If theological belief is to receive justification from

⁵² Such as the entire Ancient Greek philosophical tradition which treated empirical data to be unreal or of secondary importance, when compared with rationalist concerns.

somewhere other than the object of study, where is the theologian to find it? Again, the inappropriateness of such a requirement is made clear by a comparison with physics. If an interlocutor will not be convinced that the physical, external world exists by a naked appeal to reality itself, from whence would the physicist gather their arguments? True epistemological objectivity is not *detachment* but radical *attachment* to the object of study.⁵³ There is no meta-discipline or *scientia universalis* that can assume a privileged epistemological position over either theological or natural science.

How might Torrance defend the position that the Christian belief in God is more valid of serious study than voodoo or astrology? It should be noted at the beginning that Torrance never embarks on any such defense. However, there does not seem to be any reason, *a priori*, why Torrance's position would necessarily require the exclusion of such topics from scientific investigation.⁵⁴ If practitioners of voodoo and astrology were to contend that their disciplines are rooted in reality itself and, as such, are capable of rigorous scientific investigation, it would seem that Torrance's position would demand that they be taken seriously and, if one were to argue against such positions, such an attempt must be made from within the framework of thought shared by those practitioners.⁵⁵

53 *TS*, 35-36. More on scientific objectivity in chapter 3.

54 Though David Munchin, *Is Theology a Science?: The Nature of the Scientific Enterprise in the Scientific Theology of Thomas Forsyth Torrance and the Anarchic Epistemology of Paul Feyerabend*. Studies in Systematic Theology., edited by Bevans, S. V. D., Miikka Ruokanen. Vol. 7. (Leiden, The Netherlands: Koninklijke Brill, NV, 2011), 133, raises this as a concern that could be raised against Torrance's *kataphysic* epistemological position by a philosopher like Paul K. Feyerabend, it is far from clear that Torrance's position must rule such topics out *a priori*.

55 Michael Polanyi, in *Personal Knowledge: Towards a Post-Critical Philosophy*. (Chicago: University of Chicago Press, 1958), 286-294, recounts how thoroughly a framework of thought, including that of modern science can resist all attacks. It seems as though speaking of voodoo and astrology might be intended to function more as propaganda, a way to dismiss an undesirable position, than as an actual argument, as is suggested by Paul K. Feyerabend, *Three Dialogues on Knowledge*. (Cambridge, Mass: Blackwell, 1991), 60-68, 74-75. If one suggests that a view one holds is similar to one they find repulsive, it might be possible to get them to reject the former without offering a concrete *argument* for why they should.

If it should happen that such practitioners are unable to provide a convincing account of the object of their study, then the problem, which could not be eliminated *a priori* is eliminated *a posteriori*. Suppose, though, that such a convincing account could be made, what would be the result? Depending on one's convictions, it may result in "throwing wide the gates to irrationalism and superstition," or it may result in a deeper appreciation of the complexities of reality. It is not clear, beyond the influence of prejudice, that Torrance's conception of a theological science is damaged by the *possibility* that voodoo or astrology might also be capable of scientific investigation on their own terms.

Is Torrance a Foundationalist?

Torrance's notion of ultimate beliefs brought him under fire from Ronald Thiemann, who suggested that Torrance is just one more example of a modern theologian whose approach is infected with epistemological foundationalism, a view that Thiemann calls "the fatal flaw which haunts the modern doctrine of revelation."⁵⁶

In a footnote which appears in the process of critiquing Torrance, Thiemann gives five of what he calls "key aspects of a foundational epistemology."

- 1) A set of non-inferential, self-evident beliefs which serve as the given or foundation of all knowledge.
- 2) A distinction between foundational beliefs and other inferential propositions.
- 3) A claim that foundational beliefs are justified immediately by a form of direct experience.
- 4) An appeal to the mental act of intuition.
- 5) An assertion of the correspondence between the self-evident beliefs and the language independent world.⁵⁷

56 Ronald Thiemann, *Revelation and Theology: The Gospel as Narrated Promise*. (Notre Dame: Notre Dame University Press, 1985), 7. Because "foundationalism" can easily become an amorphous "swear word," we shall be concerned only to address Thiemann's charge of foundationalism and the specific issues it involves.

57 Thiemann, *Revelation and Theology*, 165.

There are several points of contention regarding whether this description of foundationalism applies to Torrance. For example, there is a very real question about what Thiemann means by beliefs that are supposed to be self-evident and whether their self-evidence is the result of their character as *statements* or whether they are considered self-evident inasmuch as they arise from a self-evident *reality*. Given the tone of Thiemann's wider critique, it would seem that he has a problem with the former. However, as will become more clear in chapter four, this is far from applicable to Torrance, who *always* prioritizes being over statement.

The real difficulties that face Thiemann's charge of foundationalism seem to lay in a misreading of a key passage from one of Torrance's major works.

The direct experience of God of which Torrance speaks is not the precognitive but rather signifies God's direct imposition of *true propositions* in the mind of the believer. Torrance believes that the *imposition of truth* which occurs in revelation is unique to theology, but in fact it is characteristic of all foundational epistemologies.⁵⁸

The conceptual background of Thiemann's concern with the "imposition of truth" is made more clear in a quotation he cites from Richard Rorty, which speaks of an object imposing the truth upon *propositions*.⁵⁹

This nuance of meaning picked up from Rorty is extremely important because it alters the entire critique and reveals its inappropriateness to Torrance's thinking. It is one thing to affirm that the objects of our knowledge impose the truth of their being upon us; it is another thing altogether to assert that such objects impose *true*

58 Thiemann, *Revelation and Theology*, 40, my emphasis.

59 Richard Rorty, *Philosophy and the Mirror of Nature*. (Princeton, NJ: Princeton University Press, 1980), 157 in Thiemann, *Revelation and Theology*, 40. It should be noted that Rorty, 159, claims that "The idea of 'foundations of knowledge' is a product of the choice of perceptual metaphors." His entire book is aimed at dismantling the notion of thinking as looking through "the eye of the mind." Torrance rejects the epistemological primacy of vision with some frequency. Given this, it would seem that Rorty would not consider Torrance a foundationalist, as he rejects the conditions upon which foundationalism relies. For Torrance's rejection of the primacy of vision in knowledge see *CT&SC*, 102-103; *DM*, 176-177; *TReconstr*; 14, 88, 169-170; *TS*, 22-23; *HJC*, 27; *BS&CL*, 1.

propositions about themselves upon us. Torrance, it seems clear, would affirm the former but would certainly reject the latter.⁶⁰

Thiemann's tendency to focus on *statements* as the primary locus of truth and knowledge prevents him from understanding Torrance adequately. Speaking of Torrance's position, especially his polemic against "the common distinction between personal and propositional revelation," Thiemann writes, "God reveals himself in his Word as mediated through the words of scripture. All personal revelation is propositional. There can be no non-propositional revelation of God."⁶¹

The evidence cited for drawing this conclusion is the first part of Torrance's chapter in *Theological Science* on "The Truth of God." However, Thiemann seems to have misunderstood Torrance's critique of the distinction between personal and propositional revelation. Torrance writes of Christ, "He is the Truth communicating Himself in and through truths, who does not communicate Himself apart from truths, and who does not communicate truths apart from Himself."⁶² This does not mean, as Thiemann seems to believe it does, that there is no non-propositional revelation of God, but rather that propositional truth cannot be separated from personal truth without distortion. It is true that Torrance believes that we have no access to the personal truth of the incarnate Word of God that bypasses the written text of scripture, but it is also true that he believes that we do not understand the written text of scripture if we do not understand it in its relation to the personal reality of Christ. Thiemann's critique could be corrected of this misreading of Torrance if he were to say, "there can be no *merely* non-propositional revelation of God." However, once this is done, his critique loses its force.

Thiemann presents his critique in a formal way.

Torrance is faced with the following inconsistent triad.

1. Theology is a rational discipline exemplifying the characteristics of a true science.

60 The crucial distinction between the "truth of statement" and the "truth of being" will be a major topic of discussion in chapter 4.

61 Thiemann, *Revelation and Theology*, 40.

62 *TS*, 147.

2. The reciprocal relation between the investigating subject and the object of inquiry is a general characteristic of rational scientific activity.

3. Theology's unique object is the truth which imposes itself on the subject independent of the subject's reciprocal influence.

The assertion of any two of these propositions demands the denial of the third. Since Torrance's argument requires all three assertions, his position appears doomed to inconsistency.⁶³

The flaw in Thiemann's argument, as we have seen, is that when he speaks of truth imposing itself on the knowing subject, he believes this takes the form of imposing *true propositions* on them, whereas when *Torrance* speaks of truth imposing itself on the knowing subject, it is in the form of ultimate and penultimate beliefs, things which cannot be rationally rejected at the time but which must always be put to the test. This reviseability inherent in Torrance's notion of the truth of statement is what ensures that the third proposition is not in contradiction with the other two.

That this is precisely Thiemann's problem is evident in how he follows up his argument. "Torrance's insistence that revelation is always linguistic in character seals the inconsistency of his position."⁶⁴ If Thiemann had not made the mistake of assuming that Torrance's rejection of a purely non-propositional understanding of revelation and truth necessarily implied an acceptance of a purely propositional understanding, he might not have made the mistake of thinking that Torrance is a foundationalist.

Thiemann is not the only one to claim that Torrance is a foundationalist. John Douglas Morrison finds it to be more or less self-evident.

Torrance never explicitly declares himself to be a foundationalist.

Torrance's explanation of the centrality of certain "ultimate beliefs," "assumptions," "fundamental ideas," and even "foundations" to proper thought which are not themselves verifiable have made clear that Torrance is a foundationalist.⁶⁵

63 Thiemann, *Revelation and Theology*, 39.

64 Thiemann, *Revelation and Theology*, 40-41.

65 John Douglas Morrison, *Knowledge of the Self-Revealing God in the Thought of Thomas Forsyth Torrance*. (New York: Peter Lang, 1997), 66.

Morrison's claim can be dispelled quickly at this stage in the discussion. It has already been made clear that ultimate beliefs, at least in the wider sense, which is how Torrance most often uses the term, are always subject to test and revision and thus not taken as self-evident propositions taken without proof after the manner of Euclid's postulates. To the degree that Torrance's uncritical acceptance of the object of study, within the context of the discipline which studies it can be considered a *kind* of foundationalism will be taken up below.⁶⁶

Morrison is quite correct that Torrance never refers to himself as a foundationalist. Subsequent to the publishing of Morrison's book, Torrance himself went on record about his alleged foundationalism, especially that claimed by Thiemann.⁶⁷

Nothing could be further from the truth or even more bizarre than Ronald Thiemann's rhetoric in which he claims that I use the term "intuition" "to signify the indubitability and incorrigibility of this *causally imposed knowledge*," and when he accuses me of what he calls "foundationalism!!" (sic) That would be equivalent to saying that Clerk Maxwell and Einstein were 'foundationalists' operating with logico-causally derived conceptions in their understanding and development of continuous dynamic fields, which is what they explicitly rejected.⁶⁸

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- 66 Tapio Luoma, *Incarnation and Physics: Natural Science in the Theology of Thomas F. Torrance*. (Oxford: Oxford University Press, 2003), 73, suggests that Torrance is "open to the criticism generally addressed to classical foundationalism, namely that one can never know for certain that the knowledge assumed is in line with reality. This makes Torrance quite indifferent toward the question, how can we know that the knowledge we have really accords with reality? His reliance upon the self-evident compelling power of independent reality cannot avoid certain features of a circular argument: we know that our knowledge accords with reality if we let its compelling power affect our understanding, and we know that the compelling force acts upon us when we adapt our knowledge to reality." That Torrance provides a much more robust and critical epistemological procedure will become clear in subsequent chapters, especially chapter 5.
- 67 Torrance's response to Thiemann was specifically within the context of responding to an essay by Colyer that argued against Thiemann's claims.
- 68 "TFTR," 331. Original emphasis. The claims of Thiemann referenced in this quote have their origin in Colyer's essay.

Though Torrance's refusal to accept that his theology was foundationalist would not necessarily make it so if a criticism such as Thiemann's were valid, there are others who have found such a claim to be a mistake. Elmer Colyer calls Thiemann's charge of foundationalism to be a "misunderstanding" of Torrance's theology.⁶⁹ Paul Molnar also finds the charge to be misguided.⁷⁰

Though it seems entirely inappropriate to speak of Torrance as a foundationalist in anything like the traditional understanding of the term, the fact that Torrance affirms that the objects of our knowledge are not open to doubt raises the question whether there might be a *kind* of foundationalism, though *extensively* reinterpreted, which Torrance actually affirms.

Elmer Colyer, who significantly opposes Thiemann, suggests that Torrance might be considered to be a "foundationalist" if we mean that knowledge is built on the "foundation" of the tacit dimension of knowledge which, as such a foundation would be impacted by the entire cultural-linguistic framework of the knower, would escape the kind of *a priorism* of classical foundationalism.⁷¹ However, this is clearly not the kind of foundationalism that Thiemann was charging Torrance with, nor is it quite adequate to Torrance's own position. In spite of my tremendous respect for my former teacher and mentor, I think we must go somewhat further.

The core of the flaw in Thiemann's critique was not in his claim that the objects of knowledge impose their truth upon us, but in his insistence that this took the form of self-evident *propositions*. What Torrance takes as the foundations of knowledge in a particular field is not a series of *propositions* but the reality itself that is under investigation. Within the context of Christian theology, we might distinguish this from classical foundationalism by calling his approach "Christo-foundationalism." Within the

69 Elmer M. Colyer, *How to Read T. F. Torrance: Understanding His Trinitarian & Scientific Theology*. (Illinois: Intervarsity Press, 2001), 17n.

70 Paul D. Molnar, *Thomas F. Torrance: Theologian of the Trinity*. (Burlington, VT : Ashgate Pub. Ltd., 2009), 326-327.

71 Colyer, *How to Read*, 243-244 and "A Scientific Theological Method," in Colyer, *Promise of Trinitarian Theology*, 228-229.

realm of science more generally, we might say that Torrance is an "onto-foundationalist."⁷²

Above, Torrance was quoted saying that it made as much sense to call James Clerk Maxwell or Albert Einstein a foundationalist as to call him one. The irony is that, if we can say that Torrance is an *onto*-foundationalist, it would seem that Clerk Maxwell and Einstein indeed could be described in a similar way.⁷³ However Torrance was quite correct that onto-foundationalism does not operate with logico-causally derived concepts but rejects such an approach altogether.

Though with the coining of the term onto-foundationalism, it seems possible to acknowledge what some might suspect is a foundationalist tendency in Torrance's thinking, it must be asked whether this justifies those who would accuse Torrance of foundationalism or whether it would be helpful, in general, to speak of foundationalism this way. To this, the answer seems to be a resounding "no." Developing a new way to think of foundationalism does not justify those who are putting forward an accusation of an entirely different kind of foundationalism. Additionally, to speak of Torrance as an onto-foundationalist might lead to some helpful changes in thinking but is likely to lead to more confusion than it is worth.

Are theoretical concerns unavoidable in empirical science?

As a result of all the issues discussed throughout this chapter, it seems clear that Torrance believes theoretical concerns are unavoidable in every field of knowledge, including theology and the empirical sciences. These theoretical concerns do not

72 I am indebted for this kind of expression to Kevin S. Diller who, in his PhD thesis speaks of Karl Barth not as an anti-foundationalist, but as a "theo-foundationalist." "The Theology of Revelation and the Epistemology of Christian Belief: The Compatibility and Complementarity of the Theological Epistemologies of Karl Barth and Alvin Plantinga" (PhD diss. University of St. Andrews, 2008), 45. Torrance's "onto-foundationalism" may be understood as a form of Barth's *nachdenken*, where human thought is a response to that which encounters us from beyond ourselves.

73 For a glimpse that Einstein considered his own thought in what could be called foundationalistic terms, see "Inaugural Address to the Prussian Academy of Sciences (1914)." In *The World as I See it*, 127-130. (New York: Covici Publishing Company, 1934), 127-128.

necessarily invalidate the knowledge that we gain when our practice is informed by them, and it cannot be said that all theoretical elements in our knowledge are the result of arbitrarily choosing the framework to which reality must conform.

Instead, it is the dynamism of reality itself that shapes our ultimate beliefs, whether we can always articulate them or not. Torrance's position does not require a foundation of self-evidently true propositions upon which to build certain knowledge. The final court which can decide the truthfulness of a proposition or conviction is not reason but *reality*. It is reality that confers truth or falsity upon our statements and it is reality alone that can generate properly ultimate beliefs and it is upon reality alone that our penultimate beliefs are finally shattered. This is the sheer *objectivity* of scientific knowledge and it is this topic that forms the focus of the next chapter.

3. Objectivity

Torrance's theology operates with an understanding of objectivity which he believes to be in significant agreement with that held by the natural sciences in the middle of the twentieth century. There is very little in Torrance's writings that articulates what has classically gone by the name of "objectivity," except where he critiques it for being "objectivistic" rather than truly objective.¹ Concerns for space do not allow for a detailed discussion of the concept of objectivity from the Enlightenment to the advent of Relativity and Quantum theory.² Suffice it to say that "objectivity" in the nineteenth century involved more or less the elimination of the knowing subject from the object of study to ensure the accuracy and reliability of measurement and description. It carried with it the conviction that the appropriate scientific attitude is one of detachment.³

This objectivistic notion of objectivity has been challenged in a fundamental way by the very field that gave rise to it: physics.⁴ The early twentieth century saw a major advance in physics that made such a notion of objectivity problematic. Relativity theory brought about the final abandonment of Newton's notion of absolute mathematical space and time, which he had constructed, in spite of his protestations that he "invented no hypotheses,"⁵ by pointing out that we do not make observations in isolation from a particular coordinate system. It is equally valid, equally "scientific," to

1 *T&C*, 153. For other condemnations of objectivism, see *G&R*, 188-189; *R&ST*, 14-15, 133, 189; *TReconstr*, 232; *TS*, 38-39, 93, 296n.

2 If space were to permit, it would seem appropriate to discuss how science operated with a concept of "truth-to-nature" and moved toward a concept of "objectivity," which has proven untenable in more recent years. Lorraine Daston and Peter Galison. *Objectivity*. (New York: Zone Books, 2007).

3 *D&CO*, 95-96.

4 *G&R*, 12-13.

5 *T&C*, 16-18. Torrance cites this as coming from Newton, *Principia* 575, [943 in the edition in the bibliography, *The Principia: Mathematical Principles of Natural Philosophy*. Translated by Cohen, I. Bernard and Anne Whitman. (Berkeley and Los Angeles, California: University of California Press, 1999) where it reads, "I do not feign hypotheses"] and *Opticks: Or a Treatise of the Reflections, Refractions, Inflections & Colours of Light*. Fourth ed. (London: G. Bell & Sons, LTD., 1931), 369.

describe the motion of a train, for example, relative to an embankment as the motion of an embankment relative to a train.⁶

What this means is that it is not possible to describe *any* phenomenon from a neutral coordinate system. There is no overarching meta-coordinate-system that removes the significance that every scientific statement is made from a particular point of view. What is astonishing, and why relativity theory does not collapse into *relativism*, is that we are always able to translate phenomena from one coordinate system to another, as all observations are invariant under the Lorentz transformation.⁷ The point for our purposes is that, while one need not have any particular coordinate system for relativity physics, we cannot escape the fact that we must always *have* one. The observer is forever bound up with the observation for a particular coordinate system, or point of view, must be assumed in every scientific description.

Torrance felt that this shift was of tremendous importance. However, not everyone has agreed with him. David Munchin writes:

We should not get too carried away with Torrance. Whilst relativity theory does require a more detailed specification of the observer, it is sometimes forgotten that the classical reduction of the observer to a mathematical point was only ever a mathematical idealisation. For whilst we might model (for instance) the pull of the earth's gravitational field on us, as a point at earth's centre of gravity attracting another point mass at our center of gravity, this was only ever a mathematical technique, which ignores empirically negligible effects - of ourselves on the earth as zero - ontologically the theory acknowledges that we are not point masses, it is just that empirically the cost of idealisation is negligible.⁸

6 The train/embankment example was a favorite of Einstein. See Part I of *Relativity, the Special and General Theory*. Translated by Lawson, Robert W. (London: Methuen & Co. LTD, 1920).

7 See Einstein, *Relativity*. "Thus the unique and central role of the speed of light and its uniform constancy enable modern science to interpret and explain the phenomena of nature with a profounder and more unrestricted notion of objectivity than was possible for classical physics." *CT&SC*, 80.

8 David Munchin, *Is Theology a Science?: The Nature of the Scientific Enterprise in the Scientific Theology of Thomas Forsyth Torrance and the Anarchic Epistemology of Paul Feyerabend*. Studies in Systematic Theology., edited by Bevens, S. V. D., Miikka Ruokanen. Vol. 7. (Leiden, The

He continues his critique, asserting that "relations have risen up the ontological league table over against objects, but relations were never entirely absent in classical natural science...So, one needs to ask more precisely why relativity theory is any more conducive to theology than classical physics?"⁹

While Munchin is correct that Newton's equations imply that we must acknowledge the existence of the knowing subject, it would be hard to defend a claim that this concern had any significant impact on the field, as is implied by the fact that Laplace's suggestion that the knowledge of the locations and momentums of particles is all that is necessary for a comprehensive knowledge of all phenomena in the past and future could be raised without fundamental controversy.¹⁰ Therefore, even if one can make the argument that classical physics still, theoretically, included a place for the knowing subject, it cannot be maintained that it took that knower seriously. Thus, the answer to Munchin's question as to why theology would prefer relativity physics over classical physics is obvious. Whatever may have been claimed, classical physics proceeded *as if* the knowing subject could be ignored while relativity physics does not allow such an approach. There are *worlds* of difference between the two.

Does Torrance believe we can deal only with the object of knowledge?

The difference between an approach that takes the knowing subject into account as opposed to one that, in practice if not in theory, does not, is the difference between what Torrance calls "objectivity" and what he terms "objectivism."¹¹

Objectivism is one of the possible outcomes of approaching knowledge with a dualism between the subject and the object.¹² As Torrance sees it, there are two forms of

Netherlands: Koninklijke Brill, NV, 2011), 57-58.

9 Munchin, *Is Theology a Science*, 58, 59.

10 Pierre Simon Laplace, *A Philosophical Essay on Probabilities*. Translated by Truscott, Frederick Wilson and Frederick Lincoln Emory. (New York: John Wiley & Sons, 1902), 4.

11 For Torrance's insistence on the distinction between "objective" and "objectivistic," see *R&ST*, 13-14; *TReconst*; 10, 232; *TS*, 38-39, 296n.

12 *R&ST*, *T&C*, 73.133. The other possible outcome is "personalism."

"objectivity" which are actually forms of objectivism as they arise out of dualistic ways of thinking. The first of these is "observational objectivity."

Observationalist objectivity is that of naïve empiricism, according to which our thought is held to be controlled by observations or observational facts which have a condition independent of the basic rational factors that arise in our scientific constructions, and which operates with a concept of the universe as inherently independent of intelligible form or intrinsically amorphous.¹³

The problem that faces observationalist objectivity is that it posits a dualism between observational and theoretical elements in our knowledge, prioritizing the former and rejecting the latter. This would be a satisfactory account of objectivity if human beings were capable of having purely observational knowledge, independent of theoretical considerations. However, this is precisely what Torrance believes is not possible.¹⁴ As it is, observational objectivity continues to operate with theoretical elements since they cannot be avoided. Its nominal rejection of such elements makes it seem as though it has succeeded in avoiding them when, in fact, it has woven particular theoretical elements, such as a conviction that metaphysical considerations are simply not relevant,¹⁵ into its very approach.

The second of the false objectivities is methodological.

Methodological objectivity arose in modern science first out of the phenomenalist dualism posited by Galileo and Newton in the foundations of science. As we have seen, the real external world was identified with a common, public world that transcended all private perspectives, knowledge of which was reached through a synthesis constructed out of the many variable sense-experiences of private observers. This distinction between real and apparent, however, could only be upheld by a distinction between absolute and relative, in which absolute space and time, regarded as constituting a homogeneous inertial

13 *T&C*, 73.

14 See chapter 2 for the inescapability of theoretical components for knowledge.

15 *T&C*, 153.

system, were erected as the rigid support and scaffolding for all scientific concepts and operations. In these circumstances, objectivity became equated with the causal absoluteness of space and time.¹⁶

Methodological objectivity has the benefit of being rather robust. Indeed when people, especially non-scientists, speak of objectivity, they are likely referring to something like methodological objectivity, a conviction that "the objective" is to be identified with that which is not dependent on any particular observer. The difficulty that arises is that, in order for such a view to be maintained, it must *construct* a framework in which to fit these publicly-available observations. This framework, in its turn, becomes what *confers* objectivity on observations even though it is not, by definition, observed by anyone.

In the end, both of these forms of objectivism fail precisely where they seem to be the strongest. Setting out to eliminate the influence of the subject on the object of knowledge, they end up imposing a subjectivity that tends to prevent the embrace of true objectivity. Observational objectivity does this by smuggling in theoretical commitments, such as the separation of observational and theoretical elements in knowledge; methodological objectivity does this by clamping an artificially generated framework down upon reality.

Though Torrance clearly sees himself as developing a notion of objectivity that stretches back hundreds of years, one of his more interesting dialogue partners on this topic is Michael Polanyi. There are two elements of this dialogue that are relevant for our understanding of Torrance's position. The first element is the recovery of what Torrance calls the "personal" or "social coefficient of knowledge."

Polanyi's rehabilitation of the personal coefficient in scientific knowledge does not imply a rejection of objectivity but of a mutilated concept of objectivity which he speaks of as *objectivism*, i.e. the severely restricted concept of "objectivity" thrown up by the positivist outlook which limits knowledge to the results of explicit inferences and therefore

16 *T&C*, 74.

leaves no room for basic beliefs or acts of the “understanding” in its determination to achieve a proper scientific "detachment."¹⁷

The majority of references to objectivity in Torrance's writing are not accompanied by an explanation that objectivity is not to be read as "objectivism" or that scientific objectivity is always personal in character. However, in his essay, "The Social Coefficient of Knowledge,"¹⁸ Torrance expresses his agreement with the Polanyian stress on the importance of *personal* knowledge but expresses his conviction that it is the person who is the "bearer of objectivity."¹⁹

In all authentic knowing we distinguish what we know from our knowing of it and at the same time we distinguish ourselves from whatever we know. We recognise our own free independent existence and we are aware of ourselves as rational subjects in the activity of knowing. But obversely we recognise what we know as having reality "on its own," independent of our knowing of it. In distinguishing ourselves from what we know we are aware of ourselves as irreducibly real subjects, who have reality in ourselves independent of other realities with which we stand in relation. But by the very same token we are aware of the other as having reality in itself independent of our knowing of it. It is this personal mode of being as subject which is precisely the mode of being in which we are aware of the objective world around us. Personal subject-mode of being is thus the bearer of objectivity.²⁰

Torrance is quoted at length because this passage gathers up several important points about the person as the bearer of objectivity. He begins with a brief analysis of what happens when we know something and asserts that we distinguish ourselves from what we know. This is never argued for but simply asserted, occasionally with the additional suggestion that the inability to make this distinction is a sign of mental illness.²¹ This seems to be the important base of Torrance's argument, the point he takes

17 *T&C*, 152-153.

18 *R&ST*, 98-130.

19 *R&ST*, 134.

20 *R&ST*, 109.

21 For such comparisons see *G&G*, 114; *DM*, 380; *G&R*, 8, 115-116; *CT&SC*, 62; *TReconstr*, 17.

for granted. If one were to approach the knowing relationship with a different set of penultimate beliefs, one would likely reach a different conclusion.

However, if that distinction can be taken as valid, Torrance's argument seems sound. If I distinguish something from myself I am affirming its ontological (though perhaps not causal or epistemological) independence from me as well as my ontological independence from it. If this independence holds good it follows that, just as I *object* to being manipulated by objects external to myself, so also the object of my knowledge *objects* to such manipulation by me.

The notion of the personal as that which is distinct from other things and persons is crucial to Torrance's thinking. If one reads "person" in Torrance and does not realize that he uses it in a very technical way which he believes to be rooted in the development of the Christian doctrine of the Trinity,²² one may quickly misunderstand what he means. Torrance is convinced that one cannot be a "person" in utter isolation. One's personhood is defined by one's relationships, primarily with God, secondarily with other persons, and in a distinctly tertiary sense, with non-personal beings.²³

The relevant implications of the subject-object distinction and the understanding that it is the *person*, the one who is self-consciously differentiated from that which they know, that is the bearer of objectivity, is that it shifts our concept of objectivity from the subjective pole of the knowing relation to the objective pole. That is to say, objectivistic ways of thinking attempt to eliminate the subject from the subject-object relation. As such, the question that is implied by the objectivistic answer is, "How is it that *we* can be objective." Rather, Torrance would have us ask how it is that *we*, being the subjects we are, can allow the *object* to be objective to us. In point of fact the object is already, by its very nature, objective to us. The goal is to respect that objectivity by letting it be what it is and not what we would have it be. Objectivity is thus achieved by continually allowing the object of our knowledge to call what we *think* we know into question so that we may purge artificial elements from our knowing and achieve knowledge, as far as we may, in terms of reality itself.²⁴

22 *CFM*, 37-41. Cf. *R&ST*, 171-172.

23 *R&ST*, 110-111.

24 For such accounts of objectivity, see *G&R*, 92; *T&C*, 75; *TS*, xv-xvi, 36, 295-296; *R&ST*, 14.

This leads us to the second important element that Torrance picks up from Polanyi regarding objectivity, and that is the way Polanyi ties objectivity with his metaphysics.

Objectivity, as Polanyi understands it, has to do not only with the bearing of our knowing upon reality but also, and preeminently, with its bearing upon the indefinite depth of rationality inherent in reality, in virtue of which reality has an inexhaustible capacity to reveal itself in unexpected ways in the future. It is indeed precisely in terms of that characteristic that Polanyi defines *reality*, that is, in terms of its independence and power to manifest itself in unthought of ways, and in corresponding terms that he defines *objective truth* in science, that is, in terms of the apprehension of real patterns inherent in nature, independent of our knowing of them, the implications of which extend indefinitely beyond the experience which they were originally meant to control.²⁵

This appropriation by Torrance of the Polanyian understanding of "reality" as "something that attracts our attention by clues which harass and beguile our minds into getting ever closer to it, and which, since it owes this attractive power to its independent existence, can always manifest itself in still unexpected ways,"²⁶ will prove to be one of the most important pieces for understanding Torrance's realism.

Though Torrance has some significant problems with what has gone by the name of objectivity in the past, it is important to note that this is not to say that such a view had nothing to recommend it. Indeed, as we shall see, it is characteristic of Torrance's realism that problematic concepts can be overturned without abandoning their true elements. That is to say, Torrance provides a robust realism that is not damaged, for example, by the development of incommensurate conceptual frameworks.

Classical elements, "such as impartiality and universal agreement" must be retained; objectivity implies that "individual feelings and opinion" may not be imposed upon the object of knowledge.²⁷ What we *think* is objective knowledge must be put to

25 *T&C*, 154. See also *TReconstr*; 54.

26 Michael Polanyi, *Knowing and Being*. (Chicago: University of Chicago Press, 1969), 119-120.

27 *T&C*, 75.

the test to see if we have actually come to grasp reality out of its own depth or whether we have artificially imposed our own preconceptions upon it.

Necessary as all this is, however, it does not constitute sufficient condition for objectivity, for objectivity, as we now understand it in the light of relativity theory, must be grounded in invariant structures inherent in the space-time universe irrespective of any and every observer. In the nature of the case, objectivity is something that cannot finally be captured by our theoretic constructions no matter how faithfully they may bear upon those invariances through their referential and ontological relations.²⁸

Objective thinking, for Torrance, is not *detached* thinking, thinking that is disinterested in the reality under consideration. Rather, objective thinking is characterized by radical *attachment* to the object, to have one's knowledge formed by that object rather than by subjective constructs.²⁹ This sheds light on why Torrance never apologized for his passionate commitment to the gospel. According to his own convictions, if he had attempted to understand and articulate the fundamental convictions of Christian faith as nothing more than a detached observer, he could not be objective. If Torrance approached theology in this way, without being deeply committed to the truth of the gospel and attempting to allow it to call his most cherished beliefs into question, then he would have no knowledge of the gospel beyond how it appeared to him from the outside. Since it is not possible to come to know something independent of a particular framework of thought, he would then have no alternative but to interpret it in light of a conceptual framework derived from elsewhere. Thus, the theologian who is "detached" from the God they study is, for Torrance, far from being objective or authoritative, but the most subjective of all. It is precisely this kind of commitment to the object of study that Torrance saw in the great scientists of the early twentieth century.

28 *T&C*, 75-76.

29 For objectivity as attachment rather than detachment, see *CT&SC*, 35; *G&R*, 6, 8-9; *KB*, 202; *R&ET*, 98; *R&ST*, 112; *TReconstr*, 123; *TS*, 35; *CFM*, 66, 138-139.

A final point about Torrance's understanding of objectivity to which we shall return in the next chapter in a discussion on truth is that objective knowledge, for Torrance, is not to be confused with timeless, unchanging *expressions* of that knowledge. Torrance agrees with Polanyi that reality is that which is able to reveal itself in unexpected ways, even the most objective knowledge can never be treated as final, for there may always be more to learn. In fact, it is never more certain that knowledge is *not* objective than when it is treated as irreformable or unchanging. "The relativity of our knowledge to external reality and its objectivity are but the obverse of each other."³⁰

Does Torrance believe we can deal only with the subject-object relation?

A concern that might be raised in response to Torrance's insistence that we can never abstract the knowing subject from the knowing relation and that there is no way to transcend the subject-object relation is how we are to keep the subjective element in our knowledge in check. If Torrance's position is not to tumble into full-blown postmodern relativism, he will need to provide ways that the subject pole of human knowledge can be kept from becoming dominant, thus allowing the object to truly govern our knowledge of it.

Torrance does this by noting that, while we can never *escape* the subject-object relation, it is not the *only* relation that exists in our knowledge. Within the context of theological knowledge, Torrance points out that we do not have to do only with God/human relations but with God/world/human or God/human/world relations.³¹ This

30 *TS*, 296. Cf. Roy Bhaskar, *A Realist Theory of Science*. 3rd ed. (London: Verso, 2008), 249. Also see *R&ET*, 12. "That is to say, the reality of the universe retains its own authority over all our inquiry and understanding, and remains the final judge of the truth or falsity of our concepts and statements about it. This is the kind of realism in which objectivity and relativity, properly understood, belong inseparably together."

31 Torrance's own terminology is God/world/man or God/man/world relations. Though Torrance intended the word "man" to be taken in its classical, inclusive meaning, *DM*, 3; *CDG*, xi-xii, this has been a point of critique. Elmer M. Colyer, "Review of: The Christian Doctrine of God, One Being Three Persons, by Thomas F. Torrance." (*Scottish Journal of Theology* 50, (1997): 389-391), 389. In

acknowledgment means that we can extend the subject-object relation in two distinct ways: by involving other persons and by involving non-personal beings, both of which serve to check our subjectivity within the knowing relation.

As has been noted already, though Torrance's intellectual positions often arise from distinctly Christian considerations, they have implications that reach beyond the confines of Christian theology into the philosophy of science more generally. While there is nothing *distinctly* Christian about acknowledging that we ought to take our relations with other persons or non-personal beings into account to keep our own subjectivities in check while attempting to learn something new, it is clear that Torrance does not believe that the Christian is free to reject this insight.³²

Torrance's insistence that we must take God/world/human relations into account is fueled by the Christian doctrines of creation and Incarnation. It is important to note that it is these two doctrines when taken *together* that require that the Christian take these relations seriously. The doctrine of creation and related convictions, shared by Jews and Muslims, can *suggest* that other people and things within that creation may have epistemological value;³³ however, it is when that concept of creation is amplified by the distinctly Christian notion that God has become incarnate in our spatio-temporal world that solidifies its importance.³⁴ For Christian faith, knowledge of God is gained primarily within the creation, through Christ and the human witness to him, rather than by purely intellectual or abstract means.³⁵ If we must acknowledge that we only know God as a community and in a world that *includes* us but cannot be reduced *to* us, how

order to remove a needless offense without altering meaning, we have elected to use a gender inclusive term.

32 *TReconstr*, 236.

33 Torrance acknowledges that certain aspects of what has now come to be the scientific worldview were shared by other monotheistic faiths, through Christianity developed them further. See *D&CO*, 2-5; *G&G*, 52-60; *CT&SC*, 60-61.

34 *D&CO*, 33.

35 Torrance's conviction is that, once God chooses to reveal himself in one way, it makes other ways of attempting to know God inappropriate. See *G&R*, 145; *MC*, 12; *R&ET*, 24. This conviction seems to be related to a point drawn from Fermat "that light takes the shortest path between two points." See *ST&I*, 66; *G&G*, 108-109; *R&ET*, 88; *T&C*, 269; *TS*, 341-342; *CDG*, 22.

much more must we recognize that our knowledge of creation is not a matter of private reflection but something shared with other humans and the rest of creation?³⁶

One further consideration is that God *objects* to our attempts to fit him into a pre-existing conceptual framework in a way that created realities cannot. It is the fact that God does not just *resist* these attempts, but actively *confronts* us that makes Christianity, perhaps, the science most rigorously dedicated to objectivity.³⁷

This is an objectivity that is the antithesis of all objectivism, for objectivism treats the object merely as an object and prescind the relation of the knowing subject to the object in such a way that the relation of the subject to the object becomes purely theoretical or logical, i.e. an abstraction. But God gives Himself to be known as personal Subject, as the one Lordly Subject who approaches us and assumes us into personal relation with Him as subjects over against His own divine majestic Subjectivity...In other words, we cannot truly know God without being reconciled and renewed in Jesus Christ. Thus the objectivity of our theological knowledge is immutably soteriological in nature.³⁸

The Christian doctrine of justification by grace alone is thus the strongest affirmation of the importance of objectivity and the greatest challenge to any attempt to justify a theology that is inappropriately formed by subjective elements.³⁹

How do we keep our subjectivity in check?

The fact that God/human relations are always just one part of God/human/world or God/world/human relations means that any individual who encounters God is not

36 *G&R*, 201-202.

37 *TS*, 56. Torrance claims that Christian theology is not *less* scientific but *more* so because of its radical commitment to objectivity.

38 *TS*, 38-39, 41.

39 For the connection Torrance sees between justification by grace and objectivity, see *G&R*, 68; *R&ET*, 18; *T&C*, 211; *KB*, 88.

alone in this encounter. There are others who have also encountered God with whom she or he can be in dialogue. Occasionally, Torrance will make reference to Polanyi's notion of a "community of experts," who are necessary for the existence of any science, not least theological science.⁴⁰ The notion of a community of experts is a frequent one in Polanyi's writing.⁴¹ The fact that such a community must be *possible*, even if a particular scientific endeavor has not yet *generated* such a community is crucial. If a community of experts is not possible, it would call into question the actual intersection of the reality we seek to know and our knowing of it. Scientific knowledge in any field cannot ever be a private acquisition; that is to say, when we say that we have come to know something, we are not speaking of a knowledge that has arisen in a highly idiosyncratic way that is impossible to be appropriated by others, but rather one that is available to all.⁴²

Munchin suggests that Torrance denies religious experience any "cash-value" because of the stress of the Reformed tradition on the primacy of scripture.⁴³ In fact, Torrance absolutely makes a place for our subjective religious experience though it is true that, for Torrance, this can never stand on its own but must be brought into dialogue with both the religious experience of others as well as scripture. To say that the Reformed tradition thinks that the scripture is where the buck stops is not the same as to say that a particular theologian in the Reformed tradition does not have a place for non-scriptural considerations. Something can be primary without becoming monolithic.

Torrance maintains that the subjective pole of the subject-object relation is kept in check, to a degree, by subject-subject-object relations or *intersubjectivity*.⁴⁴ In

40 For the importance of community in theological knowledge, see *JL&PL*, 41-42; *TS*, 163; *G&R*, 201-202.

41 Michael Polanyi, *Personal Knowledge: Towards a Post-Critical Philosophy*. (Chicago: University of Chicago Press, 1958), 53, 163-164, 216-219, 375-376.

42 The question as to whether any reality is truly open to *all* is the question as to the role of *verification* in scientific activity, which will be addressed below.

43 Munchin, *Is Theology a Science?* 84.

44 Torrance does not always speak with such inelegant terminology. However, it is helpful to use it here as it makes the relationship between this concept and the subject-object relation, which Torrance does not believe we can escape, clearer in spite of being somewhat clunky language. For the need of the community for the rationality of all knowledge, see *TS*, 210.

subject-subject-object relations, we are not dealing merely with the fact that, whenever someone knows something, it is always *they* who know it, but with the fact that they are not the *only* ones who know it. Our experience in any of the sciences, whether natural or theological, is never *merely* our own experience, but is also the experience of others with whom we can enter into dialogue.⁴⁵

The very fact that God reveals himself to us, and gives himself to us, within the space-time structures of our world, where we also communicate with one another, implies that we do not have to do with God except as he relates himself to the world, and we do not have to do with the world except as the realm where we have to do with God as well as with one another and where therefore it is invested with a sanction beyond the beauty and harmony of its inherent rational order.⁴⁶

It is, of course, possible that I may be mistaken in my understanding of what I have experienced, but what I *think* I know can be brought into a kind of dialectic with what *another* person thinks *they* know.⁴⁷ By expanding the knowing relationship beyond a single subject, a process which might resemble a kind of epistemological triangulation can take place. Torrance believes that this kind of triangulation arises when more than one mind meet and refer to an object they both have epistemic access to in order to test their knowledge.

Propositions take place within the relation of objectivity between two subjects where the objectivity of one encounters the objectivity of another and where the ultimate decisions are not taken in the isolation of

45 *R&ST*, 112.

46 *R&ST*, 189.

47 The purpose of this "dialectic" is not to merge the experiences of different people into a kind of Hegelian synthesis, but to discern similarities and overlap of experience. It should be clear that the conviction that a person may not be certain with regard to what they have experienced and that they can seek discussion with others to clarify their interpretation of their own experience presupposes an understanding of doctrine that is more complex than the "experiential expressivism" of much modern theology as described by George Lindbeck, *The Nature of Doctrine: Religion and Theology in a Postliberal Age*. (London: SPCK, 1984), 16, 31-32. See also Alister E. McGrath's response, *The Genesis of Doctrine: A Study in the Foundation of Doctrinal Criticism*. (Oxford: Blackwell, 1990), 20-26.

one mind but in dependence on another or other minds. Of course no such encounter takes place *in vacuo*, but only in relation to a reality objective to both subjects and in a medium from which they draw their signs for communication with one another. Propositions have their place, therefore, in a triadic relationship in which some 'object' is pointed out or put forward by one person for the attention of another who is meant to apprehend it under the direction of the proposing statement and through a judgement on his part in agreement with that of the proposer.⁴⁸

It is because of this inherently objective characteristic that makes propositions, where one person "proposes" something for the independent judgment of another person, superior to "judgments," where decisions and interpretations take place within a single mind.⁴⁹ If it is inherently impossible to direct another person to an object, it must be asked whether such an object actually exists. This is not to say that all such direction is of the same kind, such as directing someone to an experimentally repeatable phenomenon, but that there must be *some* way to appeal beyond the specific spatio-temporal experience of a single person. In the natural sciences, this takes place in universities, laboratories and conferences. In theology this takes place primarily in the church, though it avails itself of academic expressions of community as well.

How does Torrance conceive the confirmation or assessment of scientific claims?

One of the most important things intersubjectivity provides is a way to verify epistemological claims.⁵⁰ For Torrance, verification is the way by which we confirm, as far as possible, the legitimacy of our knowledge. According to his view, this can only happen along the lines of the "triadic relationship" noted above, where two minds meet and are mutually referred to an object external to each of them.

48 *TS*, 162-163. See also 350-351.

49 *TS*, 161-163.

50 It must be noted that, for Torrance, verification does not function as it did for the positivists.

We can only 'convince' others of the truth of our existence-statements if we can get them to see or hear the reality they refer to as we see or hear it. It can never be forced upon them. They must be brought to share our intuition of the object given. That does not mean that by describing or explaining to others our intuition we can induce them to have a similar experience, for no act of knowledge is explainable from the side of the knowing subject (i.e., psychologically) but only from the side of the object known, for true knowledge arises in proportion as the subject allows his knowing to be determined by the nature of the object before him.⁵¹

If we are to verify an epistemological claim, we cannot do this by reflecting on it in an abstract way but must actually get someone to experience reality, to a degree, as we do. In a simple case, such as the statement, "The sky looks blue today," verification may involve nothing more than the other person looking at the sky and confirming that, as they see it, the sky is indeed blue. However, if the claim is more complicated, it may require more effort from the verifier. The difficulty that Torrance seems to be attempting to draw attention to is that two different persons may not be equally prepared to discern a reality. If someone, such as myself, has poor eyesight, it will not be sufficient to have her look at the same thing as someone with perfect eyesight. Rather, one's vision must be operating appropriately, in this case with corrective lenses, in order to be in a position to verify the claims made by another person. According to theologians as significant to Torrance as Athanasius, it might be that in order for one to get the "lenses" one needs to gain certain knowledge she might need to go to a particular place or adopt a particular kind of lifestyle, or else she is not in a position to verify or falsify a particular claim.⁵²

It is important to note that, while Torrance's understanding of verification requires differences in procedure depending on whether we are dealing with claims to

51 *TS*, 165.

52 Athanasius. *On the Incarnation*. Translated by Behr, John. Yonkers, (New York: St. Vladimir's Seminary Press, 2011). §57, 173.

know God or claims to know created things,⁵³ it is effectively the same, *mutatis mutandis*, in every field. In both fields, claims are ultimately reliant on reality itself for their truth or falsity.

Science is ultimately cast upon the grace of reality for the justification or verification of its theories and results. That is to say, justification by faith alone applies no less in the realm of scientific knowledge than it does in the realm of theological knowledge, for in both we rely entirely upon the dynamic processes of order inherent in that which we seek to know, the contingent universe or God the Creator of the universe. We express that reliance by the affirmation of our belief.⁵⁴

No science, whether natural or theological, has any authority higher than the object of study to which they may appeal. No theoretical framework or meta-discipline can arbitrate between differences of opinion with final authority when reality itself does not do so.

Within the context of theological knowledge, Torrance believes that, "for verification we can only cast ourselves ultimately upon the justifying Grace of God, since in the last resort verification of our knowledge of God must come to us from without from God Himself."⁵⁵ However, this reliance on grace is not something that is only the case in theology. Torrance is quite convinced that the same must be said about the verification of claims in the natural sciences, though in this case it is the "grace of reality" that justifies our statements.⁵⁶

What is the relationship between discovery and verification?

Torrance's understanding of verification might be more significant because of what it does *not* include than what it *does*. Verifying an epistemological claim, for

53 On the need for knowledge to be justified by the nature of what we know, see *TS*, 193; *R&ET*, 148.

54 *T&C*, 211.

55 *TS*, 197. See also 201.

56 This expression can be found in *T&C*, 211 and "TR," 183.

Torrance, involves going through more or less the same process as the one who discovered it went through.

There is of course a proper distinction between how a scientist actually comes to find out something and how he subsequently writes it up and presents it, termed by Reichenbach the “context of discovery” and the “context of justification,” but it is another matter through rational reconstruction to clamp down prescriptively a hypothetical-deductive theory of scientific discovery and verification upon unformalisable heuristic operations.⁵⁷

That is to say the scientist, when presenting her work for verification, does not communicate precisely the process they went through.⁵⁸ This is not least because it is impossible to reduce the experience of discovery to statements. The messy process of discovery can be tidied up somewhat for clarity of presentation, but this distinction does not allow one to conclude that, while scientific discovery does not need to follow any particular rules, when the time comes to verify those claims, they must be able to be explained in terms of what the community of scientists already knows. Rather, it is precisely the fact that new knowledge cannot explained in terms of old knowledge that makes it a *discovery* rather than a mere outworking of the implications of what we already knew.⁵⁹

Torrance makes a distinction between gaining new knowledge and working out the implications of what we already know, though it must be granted that sometimes this outworking can *feel* like a new discovery.⁶⁰ New knowledge according to this understanding cannot, by definition, be explained in terms of what we already know,

57 *T&C*, 101n.

58 *TS*, 197-198.

59 Travis M. Stevick, "Openness and Formal Logic in the Natural and Theological Sciences According to T. F. Torrance." (*Participatio* 2 (Supp. Vol.), (2013): 37-66), 56, 62. This distinction shows that, like Feyerabend, Torrance prefers "revolutionary science" over "normal science." David Munchin, "‘Is Theology a Science?’ Paul Feyerabend's Anarchic Epistemology as Challenge Test to T. F. Torrance's Scientific Theology." (*Scottish Journal of Theology* 64, 2011: 439-455), 449.

60 *TS*, 250. Logic can “do some difficult thinking for us by unfolding the implications of our scientific work beyond what we could determine with our empirical statements alone.”

otherwise it would not be *new* knowledge. One of the significant implications of this distinction is that, for Torrance, there can be no sharp dualism between the context of discovery and the context of justification. There are no *a priori* rules by which new would-be discoveries are justified. No such rules would be appropriate for, if they are claimed to exist, it would seem to imply either that new knowledge will necessarily be similar to knowledge we have already gained or that we are clamping down an artificial framework of thinking upon all knowledge. It would seem that Torrance would not approve of either option.

The fact that there is no fundamental difference between the context of discovery and that of verification or justification is due to the lack of a "logical bridge" between our concepts and experience.⁶¹

There is indeed a deep and wonderful correlation between concepts and experience, and science operates with that correlation everywhere, but since there is no logical bridge the scientist does not work with rules for inductive procedures, and cannot finally verify his claims to have discovered the structures of reality by logical means. This does not imply that there are not immensely important logico-deductive processes that have to be undertaken in the construction of scientific theories and in testing their consistency, but the actual way in which they are applied to empirical existence, which is such a crucial test, is not basically different from the way in which they are discovered by the scientist in the first place.⁶²

This denial of a logical bridge between our concepts and experience is an important part of Torrance's realism, for it implies that we never have merely empirical science but our engagement with reality is always *empirico-theoretical*. We shall return to this and its implications in chapter five.

61 It would seem that Torrance got the term "logical bridge" from Einstein. If not the term, Torrance certainly considers Einstein to be one of the greatest enemies of the idea expressed by it. See *D&CO*, 59, and its note on 150-151. See also *T&C*, 120.

62 *R&ST*, 76.

This theoretical objection is not the only one Torrance has regarding the positing of a sharp difference between the context of discovery and the context of justification. Expressing the same problem but with different terms, Torrance writes the following.

The actual work of discovery is carried out by the *scientiae speciales* which all presuppose and overlap with one another in *scientia generalis*, but the *scientia generalis* is bound to what is known like the *scientiae speciales*. Philosophy, however, is not bound in that way for its activity is not limited by a particular object or a set of objects and therefore has a considerable range of freedom within the possibilities and necessities of thought. It is concerned with what Whitehead called “complete generality” or “necessity in universality.” It is much more like abstract mathematics which is not bound by the limitations of the concrete or of space and time, but because it is like abstract mathematics and because it is concerned, like *scientia generalis*, with the overlap between the *scientiae speciales*, philosophy is constantly being tempted to identify itself with *scientia generalis*, and through schematization to abstract mathematics to conceive of itself as a *scientia universalis*. In so doing, however, philosophy confounds itself as a way of thinking with a way of discovery, and so lays down principles for verification which do not coincide with the actual ways of discovery in the special sciences, and would, if taken seriously, cut away the ground from beneath the special sciences and make them meaningless.⁶³

A sharp separation between the context of discovery and the context of justification leads, according to Torrance, to nothing short of a marginalization of all the special sciences in favor of some mythical and omni-competent philosophy of science.

A well-known, and highly controversial philosopher who would seem to be of a similar opinion regarding the relation between the context of discovery and the context

63 TS, 114-115. Cf. Feyerabend's argument in *Against Method*. 3rd ed. (London: Verso, 1993).

of justification is Paul Feyerabend.⁶⁴ Within the context of a dialogue, Feyerabend criticizes what goes by the name "context of justification."

OK - but then you must also admit that what you call the context of justification - the situation when you have unambiguous and highly corroborated instances and a clear generalization and ask how one is related to the other - is an ideal case that almost never occurs in practice...What we have in practice is always a theory, which occasionally is formulated in very ambiguous terms (think of Bohr's older quantum theory!), evidence that points in all sorts of directions and a judgment which says what is reliable and what not and accepts the theory on that basis.⁶⁵

Elsewhere, Feyerabend asserts that "the idea of a science that proceeds by logically rigorous argumentation is nothing but a dream," applies to the context of justification every bit as much as it does to the context of discovery.⁶⁶

What role do non-personal objects play in gaining knowledge?

Subject-subject-object relations, or intersubjectivity, can go far in keeping our individual subjectivity in check. However, it would be a mistake to conclude from this

64 For much more on the ways Torrance and Feyerabend are similar or dissimilar, see Munchin, *Is Theology a Science?*

65 Paul K. Feyerabend, *Three Dialogues on Knowledge*. (Cambridge, Mass: Blackwell, 1991), 86-87. The fact that this point is taken from a dialogue and thus cannot be uncritically assumed to be a fixed position of Feyerabend is a feature common to all of Feyerabend's writings, which are frequently characterized by an ironical tone or an expression of "devil's advocacy." This is a point where Munchin, *Is Theology a Science*, 188, seems to have misunderstood Feyerabend, as he implies that Feyerabend was going through a Critical Rationalist phase when he wrote *Against Method*, whereas Feyerabend has been clear that it was written as it was because it was originally an essay for Imre Lakatos and he wrote from the point of view of a rationalist because Lakatos was a rationalist. *Against Method*, vii.

66 Paul K. Feyerabend, *Farewell to Reason*. (London: Verso, 1987), 10.

that something that achieves intersubjective affirmation is "true" in anything like a traditional sense of the term. The most one can hope to assert with intersubjective evidence is what could be called "truth by consensus." The major weakness of such a position is that consensus can and often does change over time. It was this that made Lakatos refer to "truth by [changing] consensus" one of what he believed to be unacceptable replacements for a notion of truth as "proven knowledge."⁶⁷

It is clear that individualistic subjectivity is a problem for authentic knowledge, but asserting intersubjectivity as an epistemological virtue raises the question as to whether there is such a thing as *corporate* subjectivity and, if so, whether it is a problem like individual subjectivity.

It is clear from Torrance's own writings that he saw a dangerous corporate subjectivity at work in the Roman Catholic Church.

In this way the Roman Church appears to have evolved a new notion of truth! The only reality it acknowledges is that which it finds in the developing forms of its tradition and continuously makes real for itself through doctrinal formulation, so that the tradition of a thing is its reality, and truth is that which conforms to this tradition as it is formed and shaped in the consciousness of the Roman Church. Thus the truth of a doctrine is what has become of it in the development of the active tradition, so that in this way the element of objectivity in the tradition is subordinated to a massive subjectivity in the mind of the Church. Hence it can be argued that for the Roman Church 'objectivity' actually and practically denotes conformity to its own mind. The ultimate criterion of truth with which it operates is appeal to its own self-consciousness which it assumes uncritically to be identical with the Mind of Christ. Truth is subjectivity, corporate subjectivity - that is what we may call the

67 Imre Lakatos, "Falsification and the Methodology of Scientific Research Programmes." In *Criticism and the Growth of Knowledge: Proceedings of the International Colloquium in the Philosophy of Science*, London, 1965, Volume 4, edited by Lakatos, Imre and Alan Musgrave, 91-196. (Cambridge: Cambridge University Press, 1970). 92. Brackets in original.

notion of the active reason in its corporate form, the *intellectus agens* combined with the dynamic creative subjectivity of the Church.⁶⁸

Though Torrance finds corporate subjectivity to be a danger for the Roman Catholic Church, this does not mean that Protestantism is not guilty of subjectivism; it is simply that Protestant subjectivity tends to be individualistic rather than corporate.⁶⁹ Indeed, it might be suggested that Protestantism can also suffer from corporate subjectivity when it gets expressed as the "establishment religion."

The question as to whether we can ever have anything more than truth by consensus is raised in the natural sciences by the work of Thomas S. Kuhn, who suggested that scientific knowledge is not merely the accumulation of facts but the successive change in what he termed "paradigms."⁷⁰ This notion, that scientific knowledge is not theory-neutral but always relative to a particular paradigm or scientific perspective shared by the community of scientists or some significant portion of that community has been criticized as making scientific change essentially no different than religious change.⁷¹ What this means is that, though the problem of corporate subjectivity is a problem for theological science, of which every theologian is aware because of the different viable traditions at work in the field of theology, it is equally a problem for the natural sciences.

For Torrance, the primary problem with corporate subjectivity within theological science is its tendency to appropriate the object of knowledge, the thing that stands over and against the knower, whether individual or corporate, and transform it into something under the control of that knower.⁷² As such, it is imperative for science, whether natural or theological, to find a way to keep corporate subjectivity under control.

Above, it was stated that Torrance provides two ways to extend the subject-object relation in order to keep subjectivity in check. The first of these was to take

68 *TS*, 79. Also, *TReconstr*, 68.

69 *TS*, 80; *TReconstr*, 68-69.

70 Thomas S. Kuhn, *The Structure of Scientific Revolutions*. 3rd ed. (Chicago: University of Chicago Press, 1996).

71 Lakatos, "Falsification," 93.

72 *TS*, 351-352.

subject-subject-object relations into account. The second is to take subject-object-object relations into account.

Torrance believes that the root of subjectivity in theology and in certain forms of the philosophy of science is a tendency to give epistemological priority to the analogy of sight.

What is really primitive, however, is precisely this pre-scientific way of thinking in pictures and images on the model of visual perception, that is, in terms only of a subject-object relation in which we cannot escape from ourselves - in the last resort this reduces all theology into some form of anthropology. In genuinely scientific thinking, however, while symbolic representation retains an essential place, we are concerned to penetrate into the objective coherences and structured interrelations of things in themselves - that is, into object-object relations in which our subject-object relations are transcended and controlled from beyond themselves by reference to the ontological structure of the realities being investigated. This transition from primitive to scientific thinking is one in which we move from mythos to logos, from image to inner logic, from subjectivity to objectivity.⁷³

This stress on the need to develop epistemological models beyond those based on the analogy of sight is due to Torrance's characteristically realist conviction that it is possible to discern relations that are not observable after the model of vision.⁷⁴ It is Torrance's conviction that natural science felt compelled to move beyond

73 *T&C*, 252. Torrance believes that the addition of what could be called auditive modes of knowing is a contribution of the Hebrew tradition to modern science. See *TReconstr*, 14-15, 170; *JL&PL*, 34n; *CFM*, 37-41. It should also be noted that, though Torrance speaks here, as elsewhere, in terms of "object-object" relations, he has not forgotten that the knowing subject is always involved.

74 Bhaskar would seem to agree. He distinguishes between the domains of the Empirical, the Actual and the Real. The first is necessarily observable, the second is accidentally so and the third is fundamentally unobservable, since it is the condition on which the other two are possible at all. However, this unobservability does not make it any less real. Indeed, Bhaskar acknowledges that the greater danger in his system is to assume that observations are *less* real than the structures and events that gave rise to them. *Realist Theory of Science*, 58-59.

observationalist modes of knowing in order to "penetrate behind sense-experience to the invisible object-object relations and dynamic field-structures which give continuity and cohesion to states of affairs in nature independent of our observations and manipulations."⁷⁵

The basic epistemological function of these subject-object-object relations is to allow the interactions between the object of our knowledge and other objects, especially when these relations play a crucial role as to what a thing *is*, to function as a form of knowledge with greater objectivity against which to compare the knowledge we believe we have gained through subject-object and subject-subject-object relations.

Torrance does not give many examples of what this looks like in either natural or theological science, but it would seem to be fairly easy to supply a few. Within the context of Christian theology, there are two kinds of "object-object" relations that leap to mind. The first has to do with the encounter of the first disciples with Jesus and the miracles he performed. In addition to the other miracles, the gospel accounts bear witness to what are often called "nature miracles," mastery over the wind and waves, to give one example. The relation between Jesus and the forces of nature is, from the point of view of the disciples, an "object-object relation," a relation in which they have no part other than the fact that they happened to witness it. Relations like this might be seen as counting against any individual or corporate conviction that, in Jesus we have to do with nothing more than a wise teacher and political revolutionary.

A further and, for Torrance, doubtless more important example of object-object relations are those we find among the Persons of the Trinity. For Torrance, these relations are the paradigmatic examples of what he calls "onto-relations."⁷⁶ The relations between the Persons are part of who they are; no single Person of the Trinity is what they are in isolation from the other two. This means that any insights gained by individuals or communities into the Person and character of Jesus must be brought into dialogue with and informed by the relations between Jesus, the Father, and the Spirit. These are relations that are both constitutive of the Divine Being as well as independent

75 *CT&SC*, 48-49.

76 The term "onto-relations" can be found in *R&ET*, 42-51; *MC*, 47; *T&C*, 230; *ST&R*, 185; *CDG*, 102-103; *CT&SC*, 26-27, 51; *D&CO*, 109-110; *JL&PL*, 43-44; *G&G*, 174.

of all creation. It would seem that the relation between the Father, the Son, and the Holy Spirit as born witness to in the New Testament is of pivotal importance if one were to argue that the divinity of Christ is not merely a subjective affirmation, whether individual or corporate.

Within the natural sciences, perhaps the clearest example of object-object relations in Torrance's writings is the development of field theory. An electro-magnetic field is not directly observable, but its *effects* are. It was the difficulty of explaining the effects of things such as magnets in terms of Newtonian mechanics that pushed James Clerk Maxwell to develop his concept of dynamic fields.⁷⁷ The taking of object-object relations into account has become a major element of modern science. Perhaps this is because of the impersonal nature of many of the objects of scientific investigation. However, Torrance believes that such relations are no less important for theological than for natural science.

What are we hoping to come to know in our scientific activity?

In an earlier quotation about object-object relations, Torrance said that the transition from mythos to logos and from subjectivity to objectivity is parallel with that from image to inner logic. Inner logic is another way that Torrance expresses the nature of reality that we seek to know. To know something truly is to know it according to its nature, to know it in accordance with its inner logic or to understand it in its inherent intelligibility.⁷⁸ Because of this, it is important to turn our attention to what Torrance means when he speaks of "truth," the more so because it turns out that he uses this term in a significantly idiosyncratic way.

⁷⁷ Torrance speaks of this difficulty and solution in *CT&SC*, 50-51 and *PCT*, 5-6.

⁷⁸ Torrance uses these terms interchangeably.

4. What does it mean to speak kata physin?

The question of truth

Why is language a problem?

Torrance's fundamental epistemological conviction is that we know something truly when we know it according to its nature.¹ We have already seen that this conviction has far reaching implications. It means that we must derive our ultimate beliefs about reality from reality itself or else we shall be guilty of importing a set of beliefs derived from elsewhere. It also means that it is not appropriate to take up an epistemological position of detachment. Rather, objectivity is less an embracing of a kind of subject-object dualism than it is a submission of the subject-pole of knowledge to the object of knowledge.

However, if we are ever to give expression to our knowledge, we must do so through the use of statements. This poses a very real problem, for unless we are dealing with our knowledge of statements, the statements we use to express knowledge about reality are of a very different nature than reality itself. Knowledge is of very little use unless it can be communicated. If Torrance's central epistemological conviction is to be of any use at all, it must be related to a theory of language. This raises questions regarding the relation of statements to being or, in other words, questions about the nature of truth and truthfulness. It is necessary to explore whether Torrance's kataphysic knowledge implies such a theory and whether it is viable.

How does Torrance understand the relation between statement and being? By way of anticipation, the relation is basically semantic.² That is to say, Torrance is

1 Elmer M. Colyer, *The Nature of Doctrine in the T. F. Torrance's Theology*. (Eugene, OR: Wipf and Stock, 2001), 15.

2 Travis M. Stevick, "Truth and Language in the Theology of T. F. Torrance." (Participatio 2 (Supp. Vol.), 2013) 73-74.

adamant that truth is not something that is primarily characteristic of our *statements* but rather is a property of the reality to which those statements direct us. Speaking precisely, it is *being* that is "true," while statements can be "truthful" if they are "rooted in reality."³ While Torrance's position can be neatly summarized in this manner, it is a highly nuanced position which cannot be properly understood except against some important background issues. It is to these issues, and relevant historical developments that we now turn.

How can we speak of that which is so different from language?

One of the great mysteries of language is that we are able to use it to describe things that are so radically different in nature from language. One modern philosopher who mused on the question of what this looks like is Ludwig Wittgenstein.

Describe the aroma of coffee! - Why can't it be done? Do we lack the words? And *for what* are words lacking? - But where do we get the idea that such a description must, after all, be possible? Have you ever felt the lack of such a description? Have you tried to describe the aroma and failed?⁴

There is a sense in which we feel that we *ought* to be able to describe a phenomenon such as a powerful smell and yet we seem utterly inadequate to the task. Even if we were to invent new words for the occasion, would that not require a clear understanding of what element of the smell of coffee we needed to describe but have as yet been unable to do so? But why do we need an unambiguous description of the smell of coffee? Can we not refer to it adequately to one familiar with such a smell for them to recall their own experiences and can we not refer to it sufficiently well so that one who is unfamiliar with the smell can decide whether it is the kind of experience they would

3 This expression, which functions as a technical term in Torrance's writing and in this thesis, will be unpacked below.

4 Ludwig Wittgenstein, *Philosophical Investigations*. Translated by G. E. M. Anscombe. (New York: MacMillan Publishing, 1968), §610.

like to have? Somehow, our inability to capture experience in our statements does not prevent communication from taking place.⁵

Can we dispense with language altogether?

Given that we are unable to reduce the complexities of reality into our conceptual statements, one might be tempted to dispense with language altogether. Why can we not operate with a conviction that there is only a non-evidential or non-conceptual relation to God where we need not be tied down to any of the problems raised by dealing with language?⁶ Torrance's chief difficulty with such a position is that it eliminates any real grounding of our concepts in the being of God and so leaves us with nothing according to which we may judge theological terms other than "our own inward experience and spirituality."⁷ Torrance believes that problems such a view intends to solve can be solved equally well, while avoiding the problems of a such a view, when "the truth of being is given its rightful priority and prerogative over all truth of statement."⁸ Given that Torrance believes that the relation between statement and being must be grappled with, we must examine how Torrance actually grapples with it.

When Torrance wants to raise the question as to how words or statements are related to reality, he most often does so within the context of a discussion on Plato's dialogue, *Cratylus*.⁹

In order to understand the insights that Torrance takes from the *Cratylus*, it is important to introduce the basic structure of the dialogue, for Torrance reads it somewhat selectively. In this dialogue, the Platonic Socrates (hereafter merely

5 Torrance does not refer to Wittgenstein's example at any point. However, it serves as an example of reflections that are not altogether unlike what Torrance's position is attempting to articulate.

6 Torrance uses the theology of Schillebeeckx as a case study of the perils of a non-conceptual and non-evidential relation to God in "TR," 176-183.

7 "TR," 181.

8 "TR" 180.

9 For the clearest connection between this topic and Plato's work, see *R&ET*, 65-66. See also, *JL&PL*, 26; *T&C*, 319-320; *TReconstr*, 89; "TR," 170-171.

"Socrates") is asked to arbitrate between two men: Cratylus who believes that words have a "natural" relation to reality and Hermogenes who thinks words are only related to reality by way of custom. In particular, Hermogenes is of the mind that the name of something is that which people agree to call it. For him, this ability to assign names does not just apply to groups of people, such as various nations and languages, but to individuals as well.¹⁰

Torrance believes that the key question at stake in the dialogue is, "Do the terms we use have their significance in virtue of some natural relation between them as verbal signs and the realities they signify, or simply in virtue of an extrinsic conventional relation?"¹¹ We shall look briefly at how the dialogue deals with the question and then note what insights Torrance appropriates from it.

Socrates sees certain pieces of truth in each of these positions but ultimately rejects them both. True to his emphasis on experts, he confronts Hermogenes by arguing that not everyone is capable of giving names to things, but only "legislators," the experts of names.¹² Even though different legislators will use different syllables, they are each attempting to give articulation to what he calls the "true name." This practice is considered parallel to the fact that, even if something is made in different places and with different materials, it can be equally good.¹³ Torrance's appropriation of this insight is clear. "The difference between words in different languages is of course due to convention yet basically, according to Plato, there is a natural, rather than a conventional relation between speech and the things signified."¹⁴

Though Socrates objected to the relativism of Hermogenes, this is not to imply that he found nothing to critique in Cratylus' would-be realist theory of knowledge. Indeed, it would seem that, for Cratylus, a "true name" is so much like that-which-it-names that one can learn as much about that-which-it-names by examining the name as one could by examining that-which-it-names directly. For Socrates, this is an absurd

10 Plato, "Cratylus." In *The Works of Plato*. Translated by Taylor, Thomas and Floyer Sydenham. Vol. 5, 455-526. (Chippenham, Wiltshire: Antony Rowe, 1996 (first in 1804)) 462.

11 *R&ET*, 65.

12 Plato, "Cratylus," 465-470.

13 Plato, "Cratylus," 468.

14 *TReconstr*, 89.

position to hold, for then there is no difference between an image and reality and we would readily confuse the two. An image is still an image, even if it is not an exact copy of reality. Indeed, as Torrance points out, an image can only be what it is intended to be if it falls short of reality to some degree.¹⁵

The conclusion that Torrance takes from this dialogue is that, at their best, our theories, terms, and such have a real rather than a purely conventional relation to reality. However, this is not to be construed as if "real" in this context meant "exact copy." Torrance maintains that there can be a real semantic relation between a statement and a reality that far outstrips it in meaning. Indeed, all referential statements have this character. This "inadequacy" of our terms to reality is not to be interpreted as a shortcoming but an indispensable part of their truth.

It must be noted that it would be inappropriate to say that Torrance "appropriates" the *Cratylus* in any sense that implies that he has faithfully and sufficiently articulated the content of the entire dialogue and is in substantive agreement with Plato's conclusion. Rather, it would be more responsible to interpret his citation and discussion of the dialogue as being evidence of his being inspired by Plato's treatment of the question. The consistency with which Torrance refers to the *Cratylus* or language used in it either explicitly or implicitly seems to imply that he genuinely thinks he is appropriating Plato at this point,¹⁶ but there are important differences between Torrance and Plato. Torrance rejects the Platonic metaphysics which lie behind Socrates' position and, while it would seem that Torrance would not be utterly opposed to a Platonic stress on experts inasmuch as Torrance thinks it is important to get our philosophy of science from practicing research scientists,¹⁷ he is also aware of the fact that there can be a gap between how one *thinks* they are operating and how they are, in fact, operating.¹⁸

15 *R&ET*, 50-51. See also *TS*, 167.

16 Explicit references were noted above. It is referenced implicitly in *DM*, 263; *R&ET*, 110-111; *T&C*, 305-306; *TF*, 36.

17 "The Ground and Grammar of Theology, Lecture 2 Q&A." Grace Communion International, accessed March 18, 2014, <http://gcitv.net/download/MiscVid/TorranceGrammar-Tape2-QA.mp3>, 19:07.

18 *T&C*, 244-245. Cf. Feyerabend, *Three Dialogues on Knowledge*. (Cambridge, Mass: Blackwell,

Torrance is something of a philosophical opportunist.¹⁹ He has a tendency, which we shall see again with his treatment of Anselm of Canterbury, to interpret a thinker somewhat freely, yet maintaining that the ideas came from those thinkers originally. This kind of opportunism can be read in an essentially harmless way. It might seem reasonable to suggest that the relation between Torrance and his philosophical influences is something like this: Torrance reads someone like Plato or Anselm. While reading, he has an insight which significantly aids him in articulating what he wants to express. Torrance then takes over the forms of thought and speech from the other thinker into his own thinking, even directing attention back to that thinker to elucidate his own point. The result would then be seen as a genuine intellectual appropriation which yields a very important, if selective, reading of the original thinkers, which plays a significant role within the framework of Torrance's own thought but which might be considered inadequate from the point of view of a historian of philosophy.

However, it must be noted that this opportunism, if not exposed and addressed, has several unfortunate consequences. First and most obvious, it risks playing fast and loose with history. By citing his own views as if they came to him from the minds of others, Torrance portrays thinkers in history as affirming views that they may not, in fact, have affirmed. Additionally, Torrance's publications cover a significant range of topics and this opportunism is woven throughout them all. It is entirely possible that those who appreciate Torrance will assume that he provides an entirely accurate reading of historical texts with which they have no firsthand experience. This may result in those following after Torrance building on the Torrancean Plato, for example, rather than the actual Plato. Thus, given that Torrance's selective readings are implicit rather than named explicitly and acknowledged openly, will tend to sow confusion.

Further, Torrance's selective reading and tendency to portray historical thinkers as supplying him with ideas to put to his own purposes implies that his ideas have a philosophical pedigree that they do not possess. Within the context of this thesis,

1991), 9.

19 Cf. Einstein's claim that, to the point of view of a systematic epistemologist, the practicing scientist must appear "a type of unscrupulous opportunist." "Remarks to the Essays Appearing in this Collective Volume." In *Albert Einstein: Philosopher-Scientist*, edited by Schilpp, Paul Arthur, 663-688. (La Salle, Ill.: Open Court, 1970), 684.

Torrance's appropriation of Plato and Anselm are taken up. It is important to note that, whatever inspiration Torrance may have gained from such thinkers and however obvious their meanings may be portrayed, his ideas are his own and are not to be traced back to antiquity or the eleventh century, respectively.

What have been the dominant views?

Painting with a broad brush, it could be said that there have two dominant views regarding the relation of statement to being: a correspondence theory of truth and a coherence theory of truth. It should be emphasized that this is a simplification as there are other views, such as the identity theory of truth or a pragmatic theory of truth. However, it would seem that the basic convictions expressed in these two primary views are particularly forceful and perennial, as they seem to crop up over and over again throughout history under different names.²⁰

20 Here are some of the ways that these convictions are mentioned in Torrance's work (If the terms arise in the context of historical discussion, the people cited as using these terms are in parentheses): Existence-statements and coherence-statements, *TS*, 164-172; Logic of Empirical Form and Logic of Systematic Form, *TS*, 222-223; Discovery and Logic (See my "Openness and Formal Logic in the Natural and Theological Sciences According to T. F. Torrance." *Participatio* 2 (Supp. Vol.), (2013)); Direct Intention and Oblique/Secondary Intention (Ockham, Peter of Spain), *TS*, 223; *G&R*, 36-37; Interrogatio and Quaestio (Valla, Calvin), *G&R*, 34; *JL&PL*, 37; *T&C*, 267-268; *HJC*, 111-112; Relations between matters of fact and Relations between ideas (Hume), *TS*, 164-165; Activa Inquisito/Inventio and Logic (Bacon), *TS*, 70; Invention and Induction (Bacon, Agricola and Valla) *HJC*, 28-29; *Ars Inventiendi* and *ars diiudicandi* (Medievals) *R&ST*, 29f; Intuitive Knowledge and Abstractive Knowledge (Duns Scotus, Occam), *TReconstr*, 79; *HJC*, 4-5, 13f; Signification and supposition (Occam), *HJC*, 15f; Semantic Meaning and Syntactic Meaning (Carnap) *TS*, 223n1; *Sachlogik* and *Sprachlogik* (German thinkers) *TS*, 226. It is also evident in thinkers not explicitly noted by Torrance. This dual emphasis is evident in Thomas Kuhn's distinction between revolutionary science and normal science, *The Structure of Scientific Revolutions*. 3rd ed. (Chicago: University of Chicago Press, 1996); Roy Bhaskar's "phases of discovery" and "phases of application," *A Realist Theory of Science*. 3rd ed. (London: Verso, 2008), 192; George Lindbeck's distinction between "ontological" truth of statement and "intrasystematic" truth of statement, *The Nature of Doctrine: Religion and Theology in a Postliberal Age*. (London: SPCK, 1984), 64; Albert

Extremely briefly, a correspondence theory of truth, in one way or another, emphasizes that our statements refer to that which is beyond themselves in an external reality while a coherence theory of truth, in one way or another, affirms conceptual consistency as the primary virtue for our statements. Torrance would consider both of these views to result from a kind of subject-object dualism, where a strong correspondence theory emphasizes the objective pole of language to the neglect of the subjective pole and a strong coherence theory emphasizes the subjective pole of language to the neglect of the objective pole.²¹

Is there a direct connection between statement and being?

The first major option for understanding the relation of statements to being we shall discuss is the idea that there is some kind of direct connection between statement and being. To say that there is a *direct* connection is not to imply that the relation between statement and being is collapsed merely to statements, for the relation may be understood as semantic in nature, but that there is a sense in which our statements, as well as the terms within them, *correspond* with reality. This is to say that if the statement, "the cat sat on the mat," is to be true, there must exist a cat and a mat and the cat must be sitting on the mat. The lack of any of these particulars would render the statement false. This view has come to be known as the correspondence theory of truth.

The roots for a correspondence theory of truth are often traced back to Aristotle in book four of his *Metaphysics*.

We begin by defining truth and falsehood. Falsehood consists in saying of that which is that it is not, or of that which is not that it is. Truth consists in saying of that which is that it is, or of that which is not that it

Einstein's distinction between "External Confirmation" and "Inner Perfection," "Autobiographical Notes," in Schilpp, *Albert Einstein: Philosopher-Scientist*, 23; and John D. Norton's distinction between empirical experiments and thought experiments, "Why Thought Experiments do Not Transcend Empiricism." In *Contemporary Debates in Philosophy of Science*, edited by Hitchcock, Christopher. (Malden, MA: Blackwell, 2004), 44-66.

21 See similar observations by Torrance, *DM*, 426; *R&ET*, 67; *G&G*, 32-35.

is not. Therefore he who says of anything that it is (or that it is not) says what is either true or false.²²

Aristotle's definition has cast a significant shadow over all subsequent reflection on the topic of truth but there is one aspect of it that is particularly relevant for our discussion. Both "truth" and "falsehood" are defined as consisting in *saying things*. For Aristotle and many who have followed in his footsteps, truth is something that characterizes our *statements*. The importance of this tradition will become clear below when we consider Torrance's rather different concept of truth. Torrance's conception of "truth" plays a key role in the unpacking of his epistemology, though it will be seen that his presentation of these ideas is not unexceptionable.

What are the strengths of a correspondence theory of truth?

Correspondence has been the dominant theory of truth throughout Western history. Because of this, one would expect that there are some clear strengths of such a theory of truth. Indeed this is so. A correspondence theory of truth provides a robust traditional notion of "Truth" in the sense that our statements are not to be considered merely in themselves or merely in an intrasystematic way but as having metaphysical implications. Statements are not true or false in themselves but are true or false based on what is the case, independent of them. In Aristotle's terminology, one cannot simply say whatever one wishes but is bound by truth to say of what is that it is and of what is not that it is not.

Within a dualistic framework of thought, a correspondence theory of truth could be seen as emphasizing the object-pole of knowledge to the neglect of the subject-pole. What the knower thinks about matters is more or less unimportant. It is what is or is not the case that is ultimate. This has implications for the testability of statements. Historically, different positions have been maintained as to how we can test our statements and check their truth value. Logical positivism operated with a "verification principle," where either it is only statements which can be empirically verified that are

²² Aristotle, *Aristotle's Metaphysics*. Everyman's Library. Translated by Warrington, John. (London: J. M. Dent & Sons LTD, 1956), book IV, chapter 7, section 1.

to be admitted as true or, in some cases, only such statements which were to be allowed as meaningful in the first place.²³

Another way to test our statements which is logically weaker than verification but which has been thought to be more tenable is a "falsification principle," most famously championed by Karl Popper, where statements could not be proved to be true but *could* be demonstrated to be false and, thus, must be abandoned. In this case, statements that were in principle unfalsifiable could be admitted as meaningful but not as scientific.²⁴

The underlying presupposition for each of these theories as to the testability of our statements is that there is a real relation between our statements and reality and that, if experience should show that our statements were not perfectly true, we must abandon them and search for more appropriate replacements. This rejection, either due to a failure to be verified or a success in being falsified, operates with a rather strong notion of correspondence. Fruitful theoretical statements which prove to be not adequate to reality are deemed "false."

What are the weaknesses of a correspondence theory of truth?

In spite of all the strengths of a correspondence theory of truth, there are some significant weaknesses that cannot be ignored. Our discussion on such topics will be informed primarily by developments within secular philosophy of science, not least because the natural sciences lend themselves more unambiguously to a strong correspondence theory of truth than other fields, such as the humanities. An argument against correspondence in the self-consciously symbolic and metaphorical disciplines of the humanities might not be perceived as having implications for the philosophy of science. However, if fields so self-consciously literal and rigorous as the natural sciences are unable to maintain a correspondence theory of truth it may be seen as having implications, *a fortiori*, in other fields.

23 See, for example, Alfred Jules Ayer. *Language, Truth and Logic*. (London: Victor Gollancz LTD, 1964), 32.

24 Karl Popper, *Conjectures and Refutations: The Growth of Scientific Knowledge*. Fourth (Revised) ed. (Frome and London: Butler & Tanner Limited, 1976), 38-39.

One of the more significant developments in the philosophy of science in the twentieth century is the introduction of the notion of *paradigms* and *paradigm shifts*.²⁵ In particular it is argued that statements about reality are only intelligible within a given paradigm. There are three main problems that arise for a correspondence theory of truth if something like this model of paradigm shifts is accepted.

The first is that a successful scientific paradigm, such as Newtonian physics, can be superseded by a new, equally successful paradigm, such as Relativity physics. In this case we can have two conceptual systems that account for a huge portion of empirical data but do so in ways that are "incommensurable" with one another inasmuch as it is not possible to translate statements from one paradigm into entirely equivalent statements in the other paradigm. In our example, the very notions of space and time have changed and, with them, the notion of objectivity. Statements that are linguistically identical bear different meanings because they are being made against the background of different metaphysical assumptions.

While the success of the new paradigm and our preference for it over the replaced paradigm are easy to explain,²⁶ for the new paradigm provides a more comprehensive and accurate account of the empirical data than the replaced paradigm, it raises the question as to how we regard replaced paradigms. A correspondence theory of truth had inclined us to believe that the entities posited by Newtonian physics, which was an undoubtedly successful system by any meaningful measure, existed in reality. With the advent of Relativity physics some crucial elements, such as absolute mathematical time and space, were rejected, implying that any reference to such elements, whether explicit or implicit, is rendered "not true" which requires the label "false." As these rejected elements were referenced implicitly by every statement in Newtonian physics it renders, on a strong correspondence theory of truth, that the entire system, and everything in it, is false. This is a disturbing idea to any who wish to maintain that Newton, though not entirely correct, was certainly on to something related

25 For the landmark text which introduced these terms and has largely shaped subsequent discussion on the topic, see Thomas S. Kuhn, *The Structure of Scientific Revolutions*.

26 That is to say, it is easy to explain once the shift has already taken place and the new paradigm has gained authority. There has been some question as to what actually constitutes "progress" in science. See Larry Laudan, *Progress and its Problems*. (Berkeley, CA: University of California Press, 1977).

to truth. The options are either to make changes to the correspondence theory of truth or to condemn replaced paradigms to be labeled as merely "false."

This line of reasoning has a further consequence. As one looks throughout history, it seems that scientific knowledge has undergone a series of paradigm shifts. According to a strong, that is unmodified, correspondence theory of truth, this means that all such replaced paradigms are false. The question then arises, "On what grounds can we believe that our current theories will fare better than those of the past?" This concern was raised by Hilary Putnam²⁷ and has been called the pessimistic meta-induction or the disastrous meta-induction.²⁸ In response to this concern, it would seem that there are only two possible courses of action: either grant the objection and assume that our current theories will not, in time, fare any better than their predecessors or assert that there is something about *this* theory that makes it immune to such replacement. The former response requires an abandonment or modification of a correspondence theory of truth while the latter maintains it but at the cost of what could be seen as chrono-centric thinking.

A third consequence which is difficult for a correspondence theory of truth raised by the theory of paradigm shifts is that of meaning variance. Over time, concepts change but sometimes the same term is used across paradigm shifts, taking on different meanings each time. A particularly clear example of this is the term "atom." The term has been around for thousands of years, being used by Democritus and the other atomists within pre-Socratic philosophy.²⁹ If we move into the early twentieth century, we find J. J. Thomson who develops what was called the "plum pudding" model of the atom, where an atom was conceived as being a more or less solid mass with electrons "floating" in it.³⁰ Not long after this Ernst Rutherford developed a new model of the

27 Hilary Putnam, "What is Realism," In *Scientific Realism*, edited by Leplin, Jarrett, 140-153. (Berkeley and Los Angeles: University of California Press, 1984), 146.

28 McMullin, "A Case for Scientific Realism." In *Scientific Realism*, 22.

29 Frederick Copleston. *A History of Philosophy*. Revised ed. Vol. 1. (Westminster, MD: The Newman Press, 1963), 73.

30 J. J. Thomson, "On the Structure of the Atom: an Investigation of the Stability and Periods of Oscillation of a Number of Corpuscles Arranged at Equal Intervals Around the Circumference of a Circle; with Application of the Results to the Theory of Atomic Structure." *Philosophical Magazine*

atom which has come to be known as the "planetary model," where the atom is conceived as being a nucleus surrounded by electrons which orbit it.³¹ Rutherford's model has, in turn, been replaced, but it is well-known enough to use as an illustrative example.

When one either uses or happens upon the term "atom," which meaning is one to give to it, that of Democritus, Thomson, Rutherford, or something else altogether? Clearly, the three models are not referring to precisely the same conceptual reality. The atoms of Thomson and Rutherford would not qualify as an atom on Democritus' definition for the modern atom can be further divided, something which is not allowed in ancient atomic theory. If we say that the term "atom" *corresponds* with reality or *refers* to reality, we must come to some conclusion on this issue, for it seems clear that they cannot *all* refer in such a way demanded by a strong correspondence theory of truth.

How have people tried to cope with these weaknesses in secular philosophy of science?

Though these weaknesses of a correspondence theory of truth within the philosophy of science are quite strong, it has not been given up without a fight. There have been several attempts to reinterpret what is meant by "correspondence" in an attempt to maintain the advantages of such a theory of truth without it crumbling in the face of its difficulties.

One attempt to preserve a robust notion of truth in the face of changing theories and paradigms is the notion of verisimilitude as found in Popper,³² one of the more

7, no. 39 (March 1904), 237. It should be noted that Thomson did not use this term in his paper. Thomson's precise language is that "atoms of the elements consist of a number of negatively electrified corpuscles enclosed in a sphere of uniform positive electrification."

31 Ernst Rutherford, "The Scattering of α and β Particles by Matter and the Structure of the Atom." *Philosophical Magazine* 6, no. 21 (May 1911), 686. "The atom consists of a central charge supposed concentrated at a point...and surrounded by a compensating charge of N electrons."

32 Popper, *Conjectures and Refutations*, 391-398.

staunch opponents to Kuhn's paradigm model of science.³³ The purpose of Popper's concept of verisimilitude is to “combine...the ideas of truth and content into one” and provide a means to measure a theory's “greater (or less) likeness in similarity to truth.”³⁴ Such a concept aims to give a quantitative measure by which we can compare which of two or more theories better approximates the truth.³⁵

Such a view could be interpreted as trying to salvage a traditional notion of truth in the face of some of the difficulties faced by a strong correspondence theory of truth. Before considering whether a view of approximate truth achieves this end, it should be noted that to grant that approximate truth is an epistemological virtue for our statements and theories is already a departure from a strong correspondence theory of truth. It is to say that even though, according to Aristotle's definition, a statement is false, there is still epistemological value.³⁶

However, it seems that this approach is unable to achieve its goals. First, the notion is rather vague. There is a great need for clarity as to what it means for something to be sufficiently “approximately true” in order to justify the label.³⁷ It would seem that, if the term is not to crumble into ambiguity, it requires something like what is found in mathematical analysis, a conceptual distance ϵ within which a theory must fall from a “true” theory in order to be a sufficient approximation to truth. However, given that such practice in mathematics requires that the value of ϵ be arbitrarily small, it

33 See Imre Lakatos and Alan Musgrave, eds. *Criticism and the Growth of Knowledge: Proceedings of the International Colloquium in the Philosophy of Science, London, 1965*. (Cambridge: Cambridge University Press, 1970).

34 Popper, *Conjectures and Refutations*, 232-233.

35 Though the term “approximate truth” is not identical to “verisimilitude,” it is a related concept and is presented as such by Popper. “I believe that we simply cannot do without something like this idea of a better or worse approximation to truth.” *Conjectures and Refutations*, 232.

36 Popper was aware of the kind of negative reaction that might arise with such an admission. “But can we really speak about a *better* correspondence? Are there such things as *degrees* of truth? Is it not dangerously misleading to talk as if Tarskian truth were located somewhere in a kind of metrical or at least topological space so that we can sensibly say of two theories – say an earlier theory t_1 and a later theory t_2 , that t_2 has superceded t_1 , or progressed beyond t_1 , by approaching more closely to the truth than t_1 ?” *Conjectures and Refutations*, 232.

37 This point is noted by Ernan McMullin, in Leplin (ed.), *Scientific Realism*, 35-36.

would not seem to be helpful within the philosophy of science for, in such a case, to say that a theory t is within ε of the truth is functionally equivalent to say that t is true. It would seem that a notion of "approximate truth" fails precisely because it is either too vague for actual use or it functions merely as a cypher for "truth."³⁸

Secondly, it seems as though the notion of approximate truth would have some real difficulty if applied as broadly as it would need to be applied in order to provide a convincing account of theoretical shifts over time. For example, it is fairly easy to apply the notion to explain why the theory or paradigm that immediately precedes the currently held theory or paradigm was held. The previous paradigm or theory can be interpreted as approximating the current one in some significant capacity, whether conceptually or empirically.³⁹ However, as the history of a field is extended, this becomes problematic. In what way, for example, can approximate truth be brought to bear on the situation where there are two or more previous theories or paradigms, each incommensurate with each other as well as with the current theory? In what meaningful sense can a plurality of mutually incommensurate theories be considered approximately true? It might seem that one could appeal to the idea that theories are approximately true in the sense that they yield empirical predictions which approximate those of a subsequent theory, but this appears to imply a non-realism of scientific theories that seems incompatible with the metaphysical claims approximate truth was introduced to preserve.

Another potentially appealing way of dealing with the inability to achieve true correspondence between our theories and reality is to make a conceptual substitution. Rather than seeking to show that our theories are "true," we might suggest that the goal

38 Stathis Psillos, *Scientific Realism: How Science Tracks Truth. Philosophical Issues in Science*, edited by Newton-Smith, W. H. (New York: Routledge, 1999), 103, does the latter when he suggests that "a theory is approximately true if it describes a world which is similar to the actual world in its most central or relevant features." In order for this definition to be useful, we must possess prior knowledge of this "actual" world in a way that bypasses our scientific theories, which is precisely what we do *not* have.

39 Such is the case in the shift from classical to relativity physics. The former can be seen as approximating the latter in terms of how they calculate empirical predictions. Classical physics is manifestly *not* an approximation of relativity physics at the conceptual level.

is to achieve theories that are "highly probable." There are a few problems with this tactic. First, it shares with the concept of approximate truth a crippling ambiguity. What does it mean to be "highly" probable and how can a sufficiently high probability be demarcated from one that is not sufficiently high?

Additionally, and here Popper sees things clearly,⁴⁰ an appeal to high probability as the aim of science, "is a characteristic development of verificationism: if you find that you cannot verify a theory, or make it certain by induction, you may turn to probability as a kind of 'ersatz' for certainty, in the hope that induction may yield at least that much."⁴¹ Indeed, according to Popper, the category, "highly probable," is not a helpful one. For example, it is quite clear that any disjunction of the form $P \vee \sim P$ has a probability of 1, yet tells us nothing at all.⁴²

Yet a further attempt to achieve the testability of theories by evidence is to push the question of testability back to another level where we may have more luck.⁴³ Imre Lakatos articulated a position that he called "sophisticated falsificationism."⁴⁴ According to such a view, we do not judge individual theories or statements based on their empirical content but on series' of such theories. For Lakatos, we are not interested in whether statements or theories are "true," but with whether research programs as a whole represent "progressive" or "degenerating problemshifts."⁴⁵

It is not at all clear that Lakatos has achieved his ends. If this is so and his position is not sustainable, it would seem to be particularly significant in the dialogue between theology and the philosophy of science. It seems that theologians and theistically minded philosophers are particularly attracted to Lakatosian research

40 Popper, *Conjectures and Refutations*, 57-59.

41 Popper, *Conjectures and Refutations*, 58.

42 Popper, *Conjectures and Refutations*, 218-220.

43 Note that here we are no longer concerned explicitly with a strong correspondence theory of truth, a testimony to the weaknesses of such a theory

44 Imre Lakatos, "Falsification and the Methodology of Scientific Research Programmes." In *Criticism and the Growth of Knowledge: Proceedings of the International Colloquium in the Philosophy of Science, London, 1965*, Volume 4, edited by Lakatos, Imre and Alan Musgrave, 91-196. (Cambridge: Cambridge University Press, 1970).

45 Lakatos, "Falsification" 31-47.

programs.⁴⁶ Perhaps this has to do with the fact that Lakatos' philosophy does not require the kind of strict verificationism or falsificationism which might feel stifling to theistic considerations while maintaining a strong affirmation of progress, rationality, and intellectual virtue in science. This combination would seem to allow the theist to avoid some of the more hostile elements of historical philosophy of science while still maintaining the unique value of scientific investigation.

However, Lakatosian philosophy of science seems unable to maintain all of its aims in a helpful way. By pushing the critical questions back to the level of research programs rather than individual theories, Lakatos severs himself from any meaningful sense of correspondence and fails to avoid the very real questions associated with such a shift, such as the question as to what we mean when we say that a theory is "true." While shifting the conversation from whether or not a particular position is true to whether or not a particular person is being intellectually virtuous is an acceptable substitution in some areas of philosophy, and one that surely contributes to a more pleasant environment for discussion, it is difficult to imagine that a scientist is quite happy to settle for being intellectually virtuous if they are hoping to provide a "true" (in some sense) account of what actually is the case. However, even if intellectual virtue is seen as an acceptable substitute for truth, in whatever sense that term is appropriate, does this not require an abandonment of anything like a correspondence theory of truth and thus open the doors to all the problems that arise when such a theory is rejected?

What would be necessary to support a Lakatosian move to the rationality of research programs as a viable interpretation of scientific progress? Lakatos himself gives us a criterion.

Can there be any objective (as opposed to socio-psychological) reason to reject a programme, that is, to eliminate its hard core and its programme for constructing protective belts? Our answer, in outline, is that such an objective reason is provided by a rival research programme

46 Nancey Murphy, *Theology in the Age of Scientific Reasoning*. (Ithaca: Cornell University Press, 1990); J. Wentzel Van Huyssteen, *Essays in Postfoundationalist Theology*. (Grand Rapids, MI: William B. Eerdmans, 1997); Tim O'Connor in a presentation at the systematic theology research seminar at the University of St. Andrews on 26 February 2014.

which explains the previous success of its rival and supersedes it by a further display of *heuristic power*.⁴⁷

This seems appropriate. However, Lakatos immediately makes it apparent that his criterion is less clear than it might seem.

However, the criterion of “heuristic power” strongly depends on how we construe “*factual novelty*.” Until now we have assumed that it is immediately ascertainable whether a new theory predicts a novel fact or not. But *the novelty of a factual proposition can frequently be seen only after a long period has elapsed*.⁴⁸

The practical upshot of this is that what Lakatos calls “instant rationality” or “instant learning” is an impossible goal. Rationality, learning and, by extension, intellectual honesty, can only be judged *a posteriori*.⁴⁹ Indeed, things become even muddier when Lakatos suggests that “As long as a budding research programme can be rationally reconstructed as a progressive problemshift, it should be sheltered for a while from a powerful established rival.”⁵⁰

First, it must be asked whether there are any boundaries as to how much “rational reconstruction” is allowed before it is considered irrational to maintain a research program. Were the elaborate modifications to the Ptolemaic cosmological system irrational? Where is the line between rational reconstruction and *irrational* reconstruction to be drawn and, if this cannot be done, has Lakatos moved beyond the “truth by [changing] consensus” he developed his philosophy to oppose?⁵¹

Additionally, it must be asked how long we are to wait in conformity with Lakatos' charge to shelter a budding research program “for a while.” Is this “while” to be measured in days, weeks, months, years, or centuries? If one answers in one way, it makes this position effectively no different than a more “naïve” falsificationism. If one answers in another way, it makes it seem as though falsification plays no role at all, regardless of how “sophisticated” it may seem. If the time we ought to wait is to vary

47 Lakatos, “Falsification” 155.

48 Lakatos, “Falsification” 155.

49 Lakatos, “Falsification” 174. See also, 154-173.

50 Lakatos, “Falsification,” 157.

51 Lakatos, “Falsification,” 92.

depending on the context, it must be asked whether it can retain any objectivity in the sense Lakatos is trying to defend.

Is there a hiatus between statement and being?

It is clear that there are some serious difficulties confronting a strong correspondence theory of truth. Even Lakatos' defense of a traditional notion of truth while granting much of Kuhn's position fails to preserve the more important strengths of such a view.

In such a situation, it must be asked whether the correspondence theory of truth is salvageable at all. Is it possible to take an entirely different approach, sacrificing the strengths of correspondence but gaining other positive elements? If so, what might it look like? It might take the form of rejecting the metaphysical reference of our statements and theories altogether. In such a case, "truth" might refer to the coherence of our statements with one another rather than any reference to what is the case, independent of those statements. This so-called "coherence theory of truth" is the primary alternative to a correspondence theory of truth.

Arguably, the most important thinker in contemporary reflection on this topic is Ludwig Wittgenstein. Wittgenstein published only a single work during his lifetime, *Tractatus Logico-Philosophicus*, in which he advanced a view that can be described as a "picture theory of meaning."⁵² This view has strong resonances with a correspondence theory of truth. In his posthumously published work, *Philosophical Investigations*, Wittgenstein self-consciously rejected his earlier position, developing a notion of a "language game." For Wittgenstein, a language game includes not only how we use language but also our forms of life in an integrated whole.⁵³ Put very briefly, the importance of Wittgenstein's later work is that it would seem to root the meaning of words and statements in how they are used in actual life and thus marginalizes the role

⁵² Ludwig Wittgenstein, *Wittgenstein's Tractatus [Tractatus Logico-Philosophicus]*. Translated by Kolak, Daniel. (Mountain View, California: Mayfield Publishing Company, 1998). See especially statement 2.1 and its commentary.

⁵³ Wittgenstein, *Philosophical Investigations*, §7.

of a "language-game-independent" reality in determining the meaning of our statements. In particular, Wittgenstein has been an influence on many Christian theologians seeking an alternative to something like a correspondence theory of truth.⁵⁴

There are some tremendous strengths of coherence, the most obvious of which is that it is untouched by the kinds of problems faced by a correspondence theory of truth. A coherence theory of truth is not bothered by a shift from one paradigm to an incommensurate one. It simply asks how each paradigm operates within its own system. The problem noted above regarding meaning variance is also a non-issue for a coherence theory of truth. It does not matter whether Democritus, Thomson, and Rutherford were speaking of the same entities by their term "atom." The coherence theorist does not ask whether there is a "reality" behind the different uses that binds those uses together. The most that a coherence theory of truth can ask is how the term functions within each framework of thought.

A practical implication of a coherence theory of truth within the context of religious dialogue is that it shifts the focus of discussion from attempting to answer the question, "Who is right," and asks instead, "How can we understand one another." While there is, and can be, no resolving of differences in such a dialogue, for there is no appeal to any reality beyond the conceptual frameworks of those involved, much progress can be made in terms of humanitarianism for the "other" is not seen as an opponent to be defeated but as a human to be understood.

If the question is asked as to where a strong coherence theory of truth finds expression in the philosophy of science, it is not clear whether such a position exists anywhere, in spite of the charges of some philosophers who dislike the turn toward coherence in the philosophy of science.⁵⁵ The reason for this seems to be the persistent pressure to take empirical content seriously, which appears to be stronger within the

54 Lindbeck, 24. Tim Labron, *Wittgenstein and Theology*. (London: T&T Clark, 2009), 85-90, names Lindbeck and Frei as examples of "post-liberal" theologians who have moved toward the position of the later Wittgenstein.

55 Such as Lakatos' claim that Kuhn's philosophy leads to "truth by [changing] consensus" and implies that "scientific change is a kind of religious change." Lakatos, "Falsification," 92-93. See also Christopher Norris, *Against Relativism: Philosophy of Science, Deconstruction, and Critical Theory*. (Oxford: Blackwell, 1997), 82-83.

philosophy of science than in other branches of philosophy. Even in some of the strongest proponents for scientific anti-realism, such as we find in Bas C. Van Fraassen's "Constructive Empiricism," where the notion of truth is all but abandoned, there is still a primary place given to "empirical adequacy."⁵⁶

However, there are moments when it seems as though a particular philosopher will say something that makes it plausible that they affirm a coherence theory of truth. Consider Kuhn when he writes, "If I am right, then 'truth' may, like 'proof,' be a term with only intra-theoretic applications."⁵⁷ In spite of such statements, it seems that most philosophers of science are not interested in a pure coherence theory of truth inasmuch as they are profoundly interested in empirical data which is seen as being at least partially non-determined by one's conceptual framework.

What are the weaknesses of coherence?

When one looks at a coherence theory of truth when one is troubled by the problems facing a correspondence theory of truth, it can seem to be just what is needed. However, there are some very serious problems that can be found with a coherence theory of truth. Unsurprisingly, just as the strengths of coherence were the mirror image of the weaknesses of correspondence, the weaknesses of coherence are the mirror image to the strengths of correspondence.

It is difficult to see how "truth" could be used in anything like a traditional sense if we are operating merely with a coherence theory of truth. In such a case, the most that could ever be hoped for in science, philosophy, or theology is conceptual consistency. Any yearning to understand reality according to its own nature is doomed to frustration since such a goal would imply that there is a way to bring our statements to bear on an external reality without being trapped in our own framework of thought. As such, it would also seem that it is very difficult, if not impossible, to devise a way to test our statements since it would not be possible, *ex hypothesi*, to do anything more

56 Van Fraassen, *The Scientific Image*. (Oxford: Oxford University Press, 1980), 12.

57 Kuhn, "Reflections on My Critics." In Lakatos and Musgrave, *Criticism and the Growth of Knowledge*, 266.

than choose between two entire systems and only when dealing with very specific phenomena.⁵⁸

The upshot of these considerations is that even someone with comparatively moderate metaphysical convictions will likely find a strong coherence theory of truth to be stifling and unsatisfactory.

Is it possible that coherence/correspondence is yet another radical dualism that must be rejected?

It might very well be asked, given Torrance's generally anti-dualistic convictions, whether the division between correspondence and coherence is just one more example of a radical dualism that must be eliminated from our thinking. Given the suggestion above that correspondence and coherence can be seen as the outworking of a subject-object dualism within our conception of how statements are related to being, this is a perfectly reasonable question. John Douglas Morrison agrees with such a suggestion. "Disjunctivist or dualist notions have trapped and distorted thinking into one or the other (correspondence or coherence) and must be corrected."⁵⁹ The difficulty arises when one asks how one should overcome this dualism.

In his monograph on Torrance, Morrison attempts to articulate Torrance's position within the correspondence/coherence debate by arguing that, for Torrance, the goal is that our statements and theories would correspond to the inner coherence of the object of study.⁶⁰ His treatment makes it clear that he understands that Torrance does not truly fit into either the correspondence or coherence camps and that there must be some way to combine the key insights of the two. There are two difficulties with his view,

58 This would seem to be the consequence of the Duhem-Quine thesis.

59 Morrison, *Knowledge of the Self-Revealing God in the Thought of Thomas Forsyth Torrance*. (New York: Peter Lang, 1997), 124.

60 Morrison, *Knowledge of the Self-Revealing God*, 123-132. "But with this goes Torrance's understanding of Truth as 'correspondence' and 'coherence,' or more particularly correspondence truth whereby the proper object is known as it is in its own inherent, internal coherence." 124.

both of which are the result of not continuing through with the investigation as far as he might have.

The first issue is that Morrison insists on placing Torrance within the correspondence/coherence debate in the sense of articulating his position as a kind of synthesis between the two views.⁶¹ This kind of exposition, intentionally or unintentionally, connotes that the entire framework of thought with both its dualistic tendencies as well as its emphasis on truth of statement over truth of being is sound. As we shall see, Torrance's position demands the abandonment of this entire way of thinking. However, the fact that he never made this explicit and, in his own way, continued to use the language of correspondence and coherence from time to time, makes Morrison's conclusion not only a plausible interpretation of Torrance but also suggests that it is an expression with which Torrance himself may well have agreed. However, the emphasis on the truth of being over the truth of statement, to which we shall turn presently, implies a different position on this topic, whether Torrance was explicitly aware of it or not.

The other problem of speaking of Torrance's position as being a correspondence to an inner coherence is one of scope. It is surely the case that Torrance's position ultimately aims at such a theoretical vision. If and when we have grasped an utterly "true" theoretical account of God or of creaturely reality, it will surely satisfy both correspondence and coherence and it will find its coherence not primarily in an independently generated notion of logic but in the coherence of the reality, whether divine or mundane, itself.

61 Both Morrison and Munchin, *Is Theology a Science?: The Nature of the Scientific Enterprise in the Scientific Theology of Thomas Forsyth Torrance and the Anarchic Epistemology of Paul Feyerabend*. Studies in Systematic Theology., edited by Bevans, S. V. D., Miikka Ruokanen. Vol. 7. (Leiden, The Netherlands: Koninklijke Brill, NV, 2011), 205-206, seem to make the mistake of concluding that Torrance's position simply means a kind of synthesis or dialectic between coherence and correspondence theories of truth. This is unfortunate because Torrance's position, arising out of his conviction that the truth of being is utterly primary over the truth of statement, actually challenges the framework of coherence and correspondence altogether. As we shall see, there is a world of difference between appropriating the insights that gave rise to two warring positions into a new, third perspective, and attempting to blend the two positions into a combined one.

The difficulty is that this way of expressing the conviction is not really a step further than a stereotypical correspondence theory of truth. That is to say, it does not deal with the issues that correspondence theories have faced regarding the problems of reference, meaning variance, incommensurability and the like. Morrison's interpretation of Torrance tends to mask the depth of the latter's insight. Nobody, including Torrance, would claim that we have already achieved a completed science in either theology or physics, as examples. Given that we anticipate at least one more paradigm shift and so must treat our concepts tentatively, how do we make sense of the usefulness of *non-final* theoretical accounts, since we more than likely affirm one right now? This is where Torrance's conception of theories being related to truth by way of correlation and "truthfulness" as theories or statements being "rooted in reality," discussed below, is helpful in understanding Torrance's realism.

Torrance's commitment to ontological realism forbids him to affirm a strong coherence theory of truth, but he is too aware of the shortcomings of a correspondence theory of truth for him to affirm that, either.⁶² If one rejects as inadequate a notion of truth that is really no more than validity but is not prepared to affirm a one-to-one correspondence between our words or statements and reality, in what way can we speak of theories as having anything to do with truth?

The attempt to simply *combine* correspondence and coherence theories of truth into a new synthesis does not provide a satisfactory solution. At its best, it can only describe the relation of our statements to being once we have already reached a "final" or "ultimate" theoretical description of reality. At that point, our theories correspond to the inner coherence of reality. However, it provides no help out of our difficulties because the problem faced in philosophy of science and, *mutatis mutandis*, theology, is how we are to maintain some sense of realism for our statements and theories, *even when they are not yet able* to correspond to the inner coherence of reality. It is at this point where we must raise the question as to whether we might consider the issue from a different angle.

62 In particular, Torrance sees a correspondence theory of truth as requiring a "logical bridge" between word and being, which he rejects. *R&ST*, 49-50.

What if, contrary to the Aristotelian tradition, truth is not primarily something to be found in *statements* but in *being*? That is to say, what if the truth of our statements was approached as if it were truth in a *secondary* or even *tertiary* rather than primary sense? What if truth is deeper, richer, and more profound than our statements could ever hope to convey? Though Torrance does not always draw particular attention to this fact, it would seem that this is precisely what he does with his notion of truth.

How does Torrance present his ideas that lead to a new position?

There are two important issues to note when considering how Torrance understands "truth" and how it differs from the Aristotelian tradition. First and perhaps most basic, though less analyzed in Torrance's own writing, is the Christian conviction that Jesus Christ *is* the Truth.⁶³

Now if we think of Jesus Christ in this way as the Truth in his own Person, our statements about him, biblical and theological statements, cannot be true in the same sense as Jesus Christ is true, for they do not have their truth in themselves but in their reference to him away from themselves, and they are true insofar as that reference is truthful and appropriate. By referring to him away from themselves, they both subordinate themselves to him and discriminate themselves from him. A semantic relation of this kind holds good, as we have seen, in any realist relation between statements and realities to which they refer. But if Jesus Christ is the ultimate Truth of God, as we believe him to be, then our statements about him, insofar as they are true, must refer to him accordingly, subjecting themselves to him and discriminating themselves from him in their utter difference from him as creaturely and contingent.⁶⁴

63 *R&ET*, 137-156; *TS*, 146-157. See John 14:6.

64 *R&ET*, 124.

If we wish to affirm the Christian conviction that Jesus Christ *is* Truth in his person, we cannot use "truth" in an undifferentiated way to refer both to Christ and our statements *about* Christ without doing damage both to the term as well as to our understanding that Christ is Truth in a way that transcends our statements *of* the truth.

A much more carefully unpacked manifestation of this insight takes the form of a discussion on Anselm of Canterbury's work, *De Veritate*.⁶⁵ Torrance points out that Anselm makes a distinction between two different "truths of statement."⁶⁶ In one sense, we say a statement is true when it makes grammatical sense, such as "the rug is brown." It is important to note that Anselm clearly acknowledges this to not be the way we usually speak of "truth."⁶⁷ In another sense, we say a statement is true because it refers to something beyond itself, such as "the rug is brown" while indicating a rug that is indeed brown. In order to help keep things clear, I have elsewhere referred to these as being, respectively, the "syntactic truth of statement" and the "semantic truth of statement."⁶⁸ When a statement has both syntactic truth and semantic truth, we say that it has "truth of signification." Another way of saying that a statement has "truth of signification" is to say that the statement is "truthful."

It is incredibly important to note that Anselm does not only affirm truth in our *statements*. Later in his work, Anselm argues that there is a truth in created things that they receive from what he calls "the highest truth."⁶⁹ This is a kind of truth that

65 *De Veritate* is also known by its English name, "On Truth," as it appears in the Bibliography. The major discussions can be found on *R&ET*, 126-137; *R&ST*, 143-147; "The Place of Word and Truth in Theological Inquiry According to St. Anselm." In *Studia Mediaevalia Et Mariologica, P. Carolo Balic OFM Septvagesium Explendi Annum Dicta*, edited by Zavalloni, P., 131-160. (Rome: Antonianum, 1971), 142-147; "Ethical Implications of Anselm's *De Veritate*." *Theologische Zeitschrift* 24, no. 5 (1968), 309-313.

66 Anselm "On Truth." In *Anselm of Canterbury: The Major Works*. Translated by McNerny, Ralph, edited by Davies, Brian and G. R. Evans, 151-174. (Oxford: Oxford University Press, 1998), Section 2, 153.

67 Anselm, "On Truth," Section 2, 154.

68 Stevick, "Truth and Language in the Theology of T. F. Torrance." The syntactic truth of statement is reflected in the coherence element in Torrance's philosophy of language; the semantic truth of statement is reflected in the correspondence element in Torrance's thought.

69 Anselm, "On Truth," Section 7. Anselm's expression in Latin is *summam veritatum*.

something has by virtue of being what it is and not something else. Here we do not have truth in the same sense that we have it when we speak of a statement being true. Rather, it is what Torrance calls "truth of being." It is an ontological, rather than a linguistic notion of truth.

It must be noted that Torrance's use of the word "truth" to refer to the "truth of being" is idiosyncratic. Some may feel that truth properly refers to a particular kind of relationship between statement and being and that it is inappropriate to use it to describe "being" or "reality" as such. It seems that Torrance picked up such terminology from Anselm and retained it as a way to conceptually relate the truthfulness of statement with the authoritativeness of created reality in the natural sciences and the absolute truth of God. Torrance's ontological notion of truth can be elucidated in contrast to the way Thomas Aquinas uses the term, as articulated by William Wood.⁷⁰

Aquinas develops his notion of "God is truth" by reference to his general theory of truth. Wood provides a formal reconstruction of three arguments in Aquinas to establish that God is Truth in a literal way. These arguments draw on his convictions that the understanding of truth as adequation of an intellect with the object it knows, that the fact that God is Truth is a logical consequence of divine perfection, and that, as the ultimate cause of all truth, God possesses truth to the maximal degree and is, therefore, the highest truth.⁷¹

It must be noted that Torrance develops his notion in a noticeably different way. Torrance, in his own development (that is, not the places where he sees himself as developing Anselm's views) begins with the relation of biblical and theological statements to Christ. He specifically says that, if Christ is the Truth, then our statements cannot be true in the same sense. He does, in this case, use the idea that Christ *is* Truth literally. We must ask what Torrance is trying to articulate in this way. What work is being done by his affirmation that Christ is Truth? After all, it could easily be claimed that Jesus intends "I am the truth" to be taken as metaphorically or as symbolically as "I am the vine" or even the other claims in John 14:6, "I am the way...and the life."

70 William Wood. "Thomas Aquinas on the Claim that God is Truth." *Journal of the History of Philosophy* 51, no. 1 (2013): 21-47.

71 Wood, "Thomas Aquinas," 28-35.

Indeed, it must be asked what “truth” adds to the concept of “being.” Wood claims that it does not add anything, at least in Aquinas.⁷² Do Torrance's convictions require a literal interpretation of Christ, and therefore God, being the Truth in a literal way?

It seems that the driving force behind Torrance's treatment of this issue is the fact that he wants to maintain that being is more basic than our statements *about* being. He could use any number of examples to try to make that point, but as a Christian theologian, he turns primarily to Christ. For Torrance, the fact that our words and statements about Christ are always marginalized when compared to Christ himself justifies a similar stratified relationship, *mutatis mutandis*, between created realities and our statements about them.

This is, as regards the points covered in this thesis, the only aspect of this stratification that truly matters. At the very least, we must say that Torrance's insistence on using the language of “truth of being” is confusing. While in his general conclusion, he stands in a long line of classical Christian theologians who held similar views,⁷³ his seeming stubbornness to retain a particular expression (noteworthy because he so frequently uses a variety of expressions for any given concern) limits his ability to communicate his concerns to those outside of a distinctly Christian theological context. This, in turn, works against his general interest of bringing the gospel to bear on our engagement with created reality.

Additionally, Torrance's practical insistence of speaking of the priority of being or reality over our statements of it in terms of the priority of the truth of being over the truth of statement is inconsistent with his other concerns that we allow our terms and statements to be marginalized by that to which they refer. The irony in this is that the marginalization of our statements in light of reality is the necessary outcome of the stratification of truth such terms were employed to safeguard. Does not the more or less uniform use of such terms imply that Torrance is unwilling to let these terms, Biblical though they may be, be challenged by that which he seeks to articulate, which would in turn question the priority of reality over what we can say about it?

72 Wood, “Thomas Aquinas,” 25.

73 See Wood, “Thomas Aquinas,” 21.

Given these critical reflections, it should be noted that Torrance consistently uses the term “truth” in this differentiated way and so, for the sake of clarity in unpacking Torrance's own usage of the term, his idiosyncratic usage will be retained in the remainder of this thesis. If this usage continues to trouble the reader after these clarifying and critical remarks, it should be noted that nothing of substance is lost if one were to substitute “reality” where one reads “truth of being.”

The distinction between the truths of statement and the truth of being means that there is a kind of stratification of truth, not to be confused with the stratification of being and that of knowledge, discussed elsewhere in this thesis,⁷⁴ where the truth of statement, truth of being, and "Supreme Truth of God (Torrance's rendering of Anselm's "highest truth") are connected to one another, but in a holistic and dynamic way rather than in a one-to-one correspondence. This means that we can say that our statement "The rug is brown," to continue with our mundane example, is true if and only if it directs us to a rug that is indeed brown. If the statement directs us to something that is either not brown or is not a rug, we would say that the statement is false. That is to say, the truth of statement is dependent on the truth of being. In its turn, both Anselm and Torrance affirm that the truth of being is dependent on the supreme truth of God for its very existence.

It is conceivable that a sincerely made statement might direct our attention to something that is so unlike what the statement would lead us to expect that we call it false. However, if the reference has indeed taken place, that is, if the statement has *in fact* directed our attention to something outside of itself, there is still a sense in which the truth of being can be served.⁷⁵ As we have seen from his engagement with Plato's *Cratylus*, Torrance speaks frequently of the need to realize that our statements are inadequate to really fully describe or refer to reality.⁷⁶ There is no logical bridge between our statements and reality. However, when we realize that our statements are not only inadequate but are misleading or otherwise distracting, we must revise our

74 Chapters 1 and 5, respectively.

75 *R&ET*, 18.

76 Such references can be found in *DM*, 265-266; *R&ET*, 66; *T&C*, 276, 305-306, 320; *TS*, 166, 329; "TR," 171; *G&G*, 144, 214; *CDG*, 76-77.

statements to more adequately, though never *entirely* adequately, bear witness to the truth of being. This means that reference may be partial and broken and yet still be genuine, for it is only in light of the fact that genuine reference has taken place, in whatever way, that we are in a position to pass judgment on our statements. It also means that there is a sense in which even our broken and partial witness to how things are is "justified" by the "grace" of reality.⁷⁷

To use Anselmian terms, it would seem that the realism/anti-realism debate in secular philosophy of science during Torrance's career was obsessed with truth of statement, where what really matters is whether our statements are true in the sense that there is a one-to-one correspondence between their terms and reality. If one were to try to force Torrance into this dialogue, he would no doubt appear to many as an anti-realist in spite of all his claims to affirm and uphold scientific realism. This would seem to be rooted in the fact that Torrance has very little interest in our statements as such. He is only concerned with our statements as the means by which we speak about and refer to reality beyond them.⁷⁸ As such, Torrance's realism is not an affirmation about particular theoretical frameworks but an affirmation that our theories, in one way or another, are making contact with a reality that lies beyond them.⁷⁹ We might say that, while the mainstream of the debate over scientific realism has seemed to be concerned with the truth of *statement*, Torrance's realism is concerned with the truth of *being*. It seems that this kind of emphasis on the truth of being to the marginalization of the truth of statement that we find in Torrance is given succinct expression by philosopher Roy

77 *T&C*, 211. It should be remembered that to be "justified" can also carry the meaning of "condemned." As such, we should not be surprised if reality "justifies" our statements by "declaring" that they must be scrapped and revised. *TReconst*, 153. See also "TR," 183, which is perhaps an even more bold statement.

78 Torrance cited Athanasius with approval, "Terms do not detract from his nature; rather does his nature draw those terms to itself and transform them. For terms are not prior to beings, but being our first and terms come second." *TF*, 129. See also *DM*, 248.

79 Torrance reminds his readers that we must not get stuck in looking at our statements but look through them to the reality that lies beyond them. See *CDG*, 44; *R&ST*, 140; *TS*, 34.

Bhaskar. "Epistemological relativism, in this sense, is the handmaiden of ontological realism and must be accepted."⁸⁰

At the risk of being repetitive, it must be stressed that it is vitally important that we keep Torrance's distinction between the truth of being and the truth of statement in mind as we unpack his thought. It bears some resemblance to what goes by the name of "realism," and shares its name, but it also has some striking similarities with what would traditionally be considered "anti-realist" arguments. However, it must be made clear that Torrance is not trying to create some kind of synthesis between the two views but is forging a different path that he believed to be more faithful to how science, whether natural or theological, has actually progressed through the centuries.

In light of this analysis, we must ask the question, how far does Torrance's approach accurately reflect what Anselm was seeking to argue? It would certainly seem that Anselm would have affirmed a correspondence theory of truth and, since something like a correspondence theory of truth seems to have been the position of nearly every other medieval and classical thinker, it is quite likely that, if we could anachronistically bring Anselm into the contemporary debate, he would affirm correspondence as well. However, Torrance's philosophical opportunism enabled him to take a small piece of Anselm's thought and appropriate it within the context of his own thinking without necessarily concerning himself to fit it in with Anselm's other conclusions. Torrance has attempted to fit this Anselmian distinction between the truth of being and the truth of statement that seems demanded by a commitment to kataphysic knowledge without being committed to a strict correspondence theory of truth. Indeed, if Torrance is correct that it is in light of the truth of being that we judge the adequacy or inadequacy of our statements, it would seem that a correspondence theory is not only not necessary, but not possible, inasmuch as such a theory maintains that truth is primarily something that *statements* have.

An understanding of Torrance's reading of Anselm's text is extremely important for understanding Torrance's philosophy of science. It makes the crucial distinction between the truth of statement and the truth of being. It might be objected that Anselm has done nothing more than give expression to a kind of Christianized correspondence

80 Bhaskar, *Realist Theory*, 249.

theory of truth. It might be argued that the assertion that statements must correspond to reality or "what is the case," implies precisely what Anselm was making explicit and what Torrance appropriates from him. However Anselm's presentation, perhaps in spite of himself, does indeed seem to go further than a mere correspondence theory of truth.

There is a sense in which Anselm's two truths of statement are the concerns of coherence and correspondence, respectively. It is important for statements to make grammatical sense, though this is not usually what we mean when we say a statement is "true." This parallels precisely the concerns of a coherence theory of truth to the extent that it insists that our statements form a coherent system, but falls somewhat short of what we usually mean when we say that a theory is "true." Additionally, it is important for statements to refer to something beyond themselves. However, Anselm's analysis suggests that for our statements to be true, they must be related to the truth of being. This focuses the notion of truth primarily on being and only secondarily on statements. It is a subtle distinction and one that will be made clearer in its application.

Who, in secular philosophy of science at the time, was making similar points?

So far our consideration of Torrance's position has focused on the way his distinctly Christian theological convictions have shaped his understanding of truth. However, it must also be noted that there were other thinkers who were making similar points, even if they were not quite identical.

Alfred Tarski's name is closely associated with a particular expression of a theory of truth.⁸¹ The most classic statement of his position is as follows. The statement "snow is white" is true if and only if snow is white. At first glance, it would seem that Tarski has done nothing more than articulate a correspondence theory of truth. However, Karl Popper points out that he has done something a bit more profound than that.

The decisive point is Tarski's discovery that, in order to speak of correspondence to the facts, as do (1) [The statement, or the assertion,

81 Alfred Tarski, "Truth and Proof." *Scientific American* 220, no. 6 (1969), 63-77.

“*snow is white*” corresponds to the facts if, and only if, snow is, indeed, white.] and (2) [The statement, or the assertion, “*grass is red*” corresponds to the facts if, and only if, grass is, indeed, red.], we must use a metalanguage in which we can *speak about two things: statements; and the facts to which they refer.*⁸²

That is to say, Tarski has realized that the goals of a correspondence theory of truth only make sense if we have a way to speak and think on more than one level simultaneously.

How close is Tarski's notion of truth to Torrance's reading of Anselm? It is certainly not far inasmuch as it affirms that we cannot do justice to the notion of truth by speaking on only one level. However, Tarski is rather far from Torrance inasmuch as he still maintains that truth is something that primarily characterizes *statements* as opposed to *being*.⁸³

Another philosopher who wrestled with a more accurate expression of what we mean by "truth" is Michael Polanyi. Polanyi modifies Tarski's position by saying, "I shall *say* that "snow is white" is true if and only if I *believe* that snow is white.' Or perhaps more reasonably: 'If I believe snow is white I shall say that "snow is white" is true.'"⁸⁴ Here, we have not only a recognition that we must think and speak at two levels simultaneously but an acknowledgement that simply to state that snow *is* white can be contested. After all, it is precisely our ability to make unambiguous statements about reality that is under question in these various theories of truth.

How does Torrance approach the relation of statement to being?

It would appear that Torrance holds to a different understanding of the relation of statement to being than those expressed by correspondence and coherence theories of

82 Popper, *Conjectures and Refutations*, 224.

83 "In this article, however, we are interested only in what might be called the logical notion of truth. More specifically, we concern ourselves exclusively with the meaning of the term 'true' when this term is used to refer to sentences." Tarski, "Truth and Proof," 63.

84 Polanyi, *Personal Knowledge: Towards a Post-Critical Philosophy*. (Chicago: University of Chicago Press, 1958), 255.

truth. He seems to navigate a third way that satisfies the goals of both correspondence and coherence theories of truth but does so in a way that is not merely a synthesis of the two views. We shall be referring to Torrance's view as a "correlation" theory of truth, due to the important role played by what he calls "empirical correlates."

It should be noted at the outset that Torrance does not develop this correlation theory of truth at length at any place in his writings. What follows is what Lakatos called a "rational reconstruction" of Torrance's position, a making explicit what is left largely implicit in the Torrance corpus.

Torrance was no friend of a merely coherence theory of truth. He was deeply suspicious of anything that seemed to sever the bond between language and being. In particular, he was worried that the later Wittgenstein led his followers down a dangerous path that failed to pay sufficient attention to the reality that lay behind various language games.⁸⁵ It will be argued later that this suspicion prevented Torrance from understanding the later Wittgenstein as a kind of realist that bore a remarkable similarity to Torrance's own form of realism. For now, suffice it to say that, if one were to force Torrance to choose between a correspondence and a coherence theory of truth, he would certainly choose the former.

It would be a mistake, however, to conclude from this that Torrance was in any way a supporter of what I have been calling a "strong" correspondence theory of truth. Indeed, it might be said that the *only* part of a correspondence theory of truth that Torrance feels compelled to maintain is that there must be some kind of *real* connection between our statements and reality. So long as that connection is maintained, it seems difficult to conclude that Torrance will be particularly picky about which terms are used.⁸⁶ This conviction, that there must be a *real* relation between our statements and reality, could be called the "correspondence element" in Torrance's thought.

The other major conviction that shapes Torrance's understanding of how our theories are related to reality is that there must be a strong distinction between the truth of being and the truth (or truthfulness) of statement.⁸⁷ It is for this reason that we spent

85 *T&C*, 318-319.

86 Torrance cites with approval the counsel of the Nicene theologians. See footnote 78.

87 See *T&C*, 304 and its elaboration in *T&C*, 317-320.

so much time drawing out Torrance's analysis of Anselm's *De Veritate* above for Torrance reliably turns to it to articulate the distinction he wants to affirm. This conviction, that we must not identify the truth of being with the truth of statement, that we must not imagine there is a one-to-one-correspondence or a "logical bridge" between the two, is the root of the "coherence element" in Torrance's thought.⁸⁸

It was claimed above that it is not possible to combine correspondence and coherence theories of truth into a new synthesis outside of the very special case where we are dealing with a "final" theory which can correspond to the inner coherence of reality. How then does Torrance weave the correspondence and coherence elements of his thought into a larger perspective? Given that these elements require coherence and consistency across a theoretical framework, yet this framework must bear upon reality, though not in a one-to-one way, Torrance's position requires an apparatus that facilitates this relation between the theoretical framework and empirical reality.

It will be helpful to consider Torrance's most sustained reflection on this problem in his own words.

On the other hand, because existence-statements are made in groups, they have to be connected together through other statements, not all of which will show an objective reference, directly at any rate...Formal and material implication cannot be separated sharply in any scientific activity, so that all statements for which ontological status is claimed must be investigated to see whether they have immediate objective reference or, if not, whether they fit in with other statements that do, and whether the pattern of reference in which they share in that way is as a whole ontologically relevant. However, since the various statements that are connected together in a pattern of reference all tend to lend evidential support for each other, it is necessary to penetrate down to the really basic existence-statements and the conceptual forms they embody

88 "By the nature of their transcendent and contingent reference they indicate that the realities to which they point range far beyond their demonstrative capacity, so that it belongs to their peculiar 'adequacy' to fall short of them. The conceptual structures of scientific theory can never have a one-to-one correspondence with the ontic structures of reality, far less be identified with them." *TS*, 239.

through which we let our minds fall under the logic in the realities to which they refer, in order that we may come to a decision as to their truth or falsity under the compulsion of the realities themselves. What sustains and fortifies us at this point is the discovery of a rationality in the nature of things that goes far beyond our understanding and that transcends the clues on which we have relied in attaining vision of it. Of course from a purely logical point of view, as Karl Popper has pointed out, we do not have to stop at any particular basic statement rather than another, but if we do not stop somewhere and accept some basic statement, the testing of a theory falls through... There are no formal-logical operations which can undertake this for us – in the last resort we are thrown back upon the judgment of our own reason.⁸⁹

Torrance is claiming is that, contrary to a strong correspondence theory of truth, there may be many statements that do not directly refer to reality. Indeed, this is *required* by Torrance's conviction that our theoretical frameworks are not related to reality in a one-to-one way. However, contrary to a strong coherence theory of truth, there must be *some* statements that *do* refer to reality. Torrance refers to the points where theoretical statements are connected to empirical reality by such reference as "empirical correlates."⁹⁰ It is important to highlight here that Torrance is relatively unconcerned with *where* these empirical correlates are to be found within a theory; it is important only that they exist somewhere.

For Torrance, the need for empirical correlates in our scientific theories, whether in natural or theological science, is based upon the reality of Christ. Though our doctrines, like our scientific theories are, in a sense, free creations of the human mind, to use Einstein's language,⁹¹ we are not free to say anything we choose to say about God.

89 *TS*, 236-237.

90 Torrance uses the phrase frequently. For the most important discussions, see *ST&I*, 89-90 and *TS*, 236-237.

91 Einstein, "Physics and Reality." In *Out of My Later Years*, 59-97. (New York: Philosophical Library, 1950), 64; *T&C*, 78-79. Note that Einstein's usage of the phrase "free creations" is very different than that of Popper. *Conjectures and Refutations*, 192.

Not all statements about God are theological statements and not all theological statements are true statements. They are truly theological and they are true in so far as they conform to the way in which the Truth of God has come to us, and are assimilated to the life of God as it has been translated into our life and history, in the human nature and activity of Jesus.⁹²

If even our statements about God must have some point of contact in the spatio-temporal empirical world, how much more must our scientific theories about that empirical world have empirical correlates?

In spite of the fact that Torrance's correlation theory of truth, though it should be noted again that he never uses the expression, has both a correspondence element and a coherence element, both "correspondence" and "coherence" are transformed in their being taken up.⁹³ The correspondence element in Torrance's thought is not the correspondence of individual terms to reality but the bearing of *entire theoretical systems* upon reality. The coherence element in Torrance's thought is not the coherence of terms relating to terms, but of terms cohering together *in the object they are attempting to represent*. That is, our system is coherent, not because of some logical necessity, but because their *object* is coherent.⁹⁴

What is the "real" in Torrance's realism?

It was suggested above that, though Torrance insisted that he was a realist, there are some elements of his thought that seem more at home with the positions advocated by anti-realist philosophers of science. The fact that Torrance does not seem to quite fit in with either realist or anti-realist schools of thought within the philosophy of science

92 *TS*, 160. See also *TS*, 242.

93 This is frequently the case for Torrance. For how "logic" is transformed in Torrance's thought, see my essay, "Openness and Formal Logic in the Natural and Theological Sciences According to T. F. Torrance." *Participatio 2* (Supp. Vol.), (2013), 37-66.

94 For more on the inherent coherence of a given reality, see my "Openness and Formal Logic."

makes it important to ask what Torrance meant by "realism." In other words, we must ask, "What is the 'real' in Torrance's realism?"

It seems clear that Torrance has no interest in insisting that our scientific theories, whether natural or theological, must always be interpreted as being real in themselves. Rather, what is "real" is that to which our theories direct us. This is perhaps given clearest expression in Torrance's insistence that, in real thinking, we do not primarily think *statements*, but rather we think reality *through* statements.⁹⁵ When Torrance speaks of a realist theory of knowledge, he is not implying that it is our *knowledge* that is real but that *what we seek to know* is real.

In a realist theory of knowledge, however, we have to do with the apprehension of some object in its inner structure which is the source of our conceptions of it, and thus regard the conceptuality which arises in this way as having a bipolar character. It is grounded in the objective intelligibility of reality, but it incorporates also a subjective counterpart, since it is we the knowing subjects who conceive and express our knowledge of it. In this case what is subjectively given is revisable in the light of the objectively given for it is grounded in it and controlled by it.⁹⁶

For Torrance, "the real" is effectively equivalent with the truth of being, to which the truth of statement is to be subjected.⁹⁷ Torrance's "realism" is ultimately an ontological rather than an epistemological claim, though it has epistemological consequences.

95 For this, see *CDG*, 44; *ST&R*, 8.

96 "TR," 179.

97 Torrance makes precisely this point in a lecture. "Ground and Grammar of Theology, Lecture 3." Grace Communion International, accessed March 18, 2014, <http://gcity.net/download/MiscVid/TorranceGrammar-Tape3.mp3>, 22:00. Torrance claims that it is true to say that scientists are not interested in "truth" if we understand the term as referring to the "timeless and necessary truths" of the philosophical tradition.

Does the inadequacy of a theory imply its falsehood?

It seems clear that Torrance's insistence that the relation between our statements and reality *need* not and indeed, in most cases, *can* not be one-to-one allows him to avoid most of the traditional problems faced by correspondence.⁹⁸ Additionally, his insistence that theories must have empirical correlates saves him from the kind of dualism between statement and being that a strong coherence theory of truth would imply. However, these very empirical correlates which do so much positive work for Torrance's views seem to let a particularly relevant problem with correspondence in through the back door.

It was claimed above that theories need empirical correlates, or statements that "genuinely refer to reality." The moment one affirms that the gap between statement and being is crossed, that *any* statements genuinely refer to reality, the problem of "meaning variance" crops up again. If we wish to say, in any meaningful sense, that Thomson's term "atom" genuinely referred to reality, are we not faced with the very real problem of the fact that the generally accepted model of what an atom is has changed dramatically since Thomson's time? It would seem that one is forced to say that, since we know that Thomson's model of the atom was not literally true in the sense that it is not possible to formulate a correspondence between his conceptual model and what "is the case," his atomic theory was not literally true and, since we have already dismissed the possibility of finding shelter in notions such as "approximate truth," must we not reject such a replaced theory as "false," full-stop?

This would certainly seem to be the case if Torrance were operating with a notion of truth that either prioritized the truth of statement or acknowledged only the truth of statement as a candidate for "truth."

A well known, but not uncontroversial, definition of scientific realism is given by anti-realist Bas Van Fraassen. "Science aims to give us, in its theories, a literally true story of what the world is like: and acceptance of a scientific theory involves the belief

98 We shall return to precisely how Torrance's position navigates the problems of realism and anti-realism in chapter 5.

that this is true. This is the correct statement of scientific realism."⁹⁹ As might be expected, the definition of a position by one who does not adhere to it is certain to be resisted, at least in part. One scientific realist who objects to part of Van Fraassen's statement is Ernan McMullin.

I do not think that acceptance of a scientific theory involves the belief that it is true. Science aims at fruitful metaphor and at ever more detailed structure. To suppose that a theory is literally true would imply, among other things, that no further anomaly could, in principle, arise from any quarter in regard to it.¹⁰⁰

It is important to note that McMullin's reaction is not against what Van Fraassen claims is the *aim* of science but rather with the conclusions he draws from it. McMullin, it would seem, sees nothing objectionable in the claim that "science aims to give us...a literally true story of what the world is like." The problem with Van Fraassen's account, according to McMullin, is the assumption that the realist believes that the theories they are committed to are representative of a science that has already achieved its goals.

By contrast, it would seem that Torrance would have a problem with Van Fraassen's entire statement. For Torrance, who very deliberately and self-consciously prioritizes the truth of being over the truth of statement, the aim of science is *not* to provide a "literally true story of what the world is like." Rather, it is to bring us into contact with reality, or the truth of being, so that we might grasp it as far as we are able. Torrance cites Einstein with approval. "Physics is an attempt conceptually to grasp reality as it is thought independently of its being observed."¹⁰¹ Though Einstein's statement could be interpreted as saying effectively the same thing as Van Fraassen, one can "attempt to grasp reality as it really is" with one's concepts without necessarily claiming that one's concepts are "literally true." It might be argued that the best way to facilitate what Torrance is after is a theory that does indeed tell a literally true story of what the world is like. However, this kind of theory is a *byproduct* of science achieving its aims, not its aim in itself and as such. To define the goal of science the way Van

99 Van Fraassen, *The Scientific Image*, 8.

100 Ernan McMullin, "A Case for Scientific Realism," 35.

101 Einstein, "Autobiographical Notes," 81. Quoted in *R&ST*, 134.

Fraassen does, in terms of literal truth, is to confuse the truth of statement with the truth of being.

For Torrance, the goal of the scientist and theologian to seek after truth is not to be understood as if the truth they are seeking is nothing more than a set of true statements. Rather, it is the truth of being and the supreme truth of God, respectively.

There is one place in Torrance's writings where he proposes a "parable" to give expression to the fact that our ideas can fall short of an absolutely "true" representation of reality while nevertheless being not entirely false or irrational.

Consider the case of the primitive person who had a large watch put into his hand with the words "that is a watch." He looked at it, saw the minute hand moving and heard the watch ticking, and then dropped it with the word "animal." He interpreted it quite properly and intelligibly within the structure of his previous knowledge. He offered an intelligent sign to stand for and express what he perceived. His perception was shot through and through with an implicit pattern of meaning, and therefore he acted significantly. He happened to be wrong, for he was lacking in information, but he was rational, for he related the facts of movement and noise in the object as particulars in a perceived whole which formed a significant pattern in the only way that was apparently possible for him. To that corresponded, therefore, the relation of ideas expressed in the word "animal" by which he sought to express in speech the pattern he used in interpretation. The next step in understanding would have involved a considerable change in the structure of his previous knowledge, for only through such a change could there take place a true perception of what was new to him, the discovery of its meaning, and the acquiring of a new sign in speech to stand for the new fact and express its meaning. An ostensive definition is meaningless apart from a coherent and indeed developing pattern of meaning.¹⁰²

The convictions implicit in this anecdote and explanation are highly pertinent for our understanding of how science can progress through paradigms, being largely

102 *TS*, 171.

incommensurate with one another, and yet still understand why our science, at every stage, is useful and not to be abandoned merely as "false."

It was noted above that one of the lessons that Torrance took up from his reading of Plato's *Cratylus* was that it is important that our words and statements fall short of reality in order to be true. If we did not believe that this were the case and we treated our statements as entirely adequate substitutes for reality, we would conflate the truth of being with the truth of statement which would, in turn, falsify both statement and being as it would eliminate the statement-being relation.

If the goal of our statements never involves them being true in a sense that conflates the truth of statement with the truth of being, what does it mean when we say that a statement or theory is "true" or "truthful?" Torrance does not consider this question at length. Perhaps it seemed entirely obvious to him. However, in order to understand what is implied in Torrance's thought, we shall need to assign a name to these kinds of circumstances. Torrance, on one early occasion, provides such a name.

The *paradeigmata* point ostensibly to divine realities beyond us, and necessarily fall far short of them. They are not for that reason false or invalid, provided that they are economically rooted in God's own acts of self-communication and condescension and are governed by them.¹⁰³

The *paradeigmata* to which Torrance refers in this passage are theological statements. "Theological statements are *paradeigmatic* in that they employ images or representations (*paradeigmata*) taken from the visible or tangible world to point out divine realities that cannot be simply reduced to words."¹⁰⁴ Thus it is clear that even early on, Torrance was concerned with distinguishing the truth of statement and the truth of being. Theological statements and, by extension, scientific statements more generally, need not be considered "false" or "invalid," provided they are "(economically) rooted" in reality.¹⁰⁵ This expression "rooted in reality," which depends

103 *TReconstr*, 51.

104 *TReconstr*, 29-30.

105 While the adjective "economically" makes sense within the context of theology, because we are concerned with our theological statements being rooted, not in an abstract concept of "reality" but in the revelation of God in the economy, it is less clear that such an adjective is needed within the context of natural science. As such, we shall adapt Torrance's expression, used in context of

upon the stratification of truth, admirably expresses the dynamic and flexible notion of the truthfulness of theories which enables Torrance to avoid the problem of reference with his empirical correlates and account for how theories which have proved inadequate to reality are not to be treated as "false" merely because of that. It must be noted that, while this phrase comes from Torrance, he does not use it often and it is never fully unpacked or developed. As such, we shall be largely putting the words "economically rooted in reality" into Torrance's mouth, but not the content expressed by that phrase.

The idea that theories do not exhaust the reality to which they refer raises points of resonance between Torrance and Michael Polanyi. A remarkably parallel way of expressing what Torrance is arguing can be found in Polanyi's writing.

One may say, indeed, quite generally, that a theory which we acclaim as rational in itself is thereby accredited with prophetic powers. We accept it in the hope of making contact with reality; so that, being really true, our theory may yet show forth its truth through future centuries in ways undreamed of by its authors.¹⁰⁶

What Polanyi speaks of as our theories "making contact with reality" is effectively equivalent to Torrance's description of our theories being rooted in reality, a similarity which will be made more clear in chapter five. At the moment, it is important to clarify what Polanyi means by "reality," as it is another point of considerable resonance between the two thinkers.

Polanyi has an understanding of what sets reality apart from the constructions of our minds that is rather congenial to Torrance's way of thinking.

This is, in fact, my definition of external reality: reality is something that attracts our attention by clues which harass and beguile our minds into getting ever closer to it, and which, since it owes this attractive power to

theological reflection, to simply "rooted in reality" when dealing with our statements of created being.

106 Polanyi, *Personal Knowledge*, 5.

its independent existence, can always manifest itself in still unexpected ways.¹⁰⁷

If this understanding of reality is appropriate - and it is clear that Torrance believes that this is so¹⁰⁸ - it means that reality is far deeper, richer, and more profound than our theoretical constructions could hope to capture. Even if science or theology were to achieve a "literally true" account of what is the case, it would still fall short of the truth of being, just as the smell of coffee can never be reduced without remainder to our descriptions of it, as noted at the beginning of this chapter. Before we can move on to the implications of our theories being rooted in a Polanyian reality, we must address a potential objection.

To some readers, the idea of theories being "rooted in reality" no doubt sounds like Torrance is saying that we do not need to reject theories in theological or natural science so long as they are "kind of" true. This, it could be claimed, is a trivial gain, since anything, or nearly anything, could be construed as "kind of" true. The point of this expression is to stress the idea that our terms and statements about reality "grow out" of the reality in which they are rooted and which, in turn, marginalizes or relativizes them.¹⁰⁹

In order to illustrate the kind of relationship implied by saying our terms, statements or theories are rooted in reality, we turn to Torrance's essay, "Theological Realism."¹¹⁰ Torrance attempts to explain how realist science "operates the bipolar conceptuality to which the unity of being and form gives rise," by examining "the place of *invariance* in relativity theory."¹¹¹ He argues that "the bipolarity of invariance...reflects the fact that our *conceptual formulation* of invariance serves the invariance *inherent in nature*, and is therefore relativized by it and is always revisable in the light of its fuller or deeper disclosure."¹¹² By speaking of our terms and statements

107 Polanyi, *Knowing and Being*. (Chicago: University of Chicago Press, 1969), 119-120.

108 Torrance cites or alludes to Polanyi's definition of reality in *BS&CL*, 15; *T&C*, 185, 254; *TRconstr*, 54; *TS*, 236-237, 296; *D&CO*, 40, 80; *JL&PL*, 33, 49; *G&G*, 136-137; *CDG*, 98.

109 It should be noted that Torrance does not press the metaphor in this picturesque way.

110 "TR."

111 "TR," 183. Emphasis in original.

112 "TR," 184. Emphasis added.

as being rooted in reality, we are stressing that being comes first and scientific terms only come *a posteriori*, such that we never allow our terms and statements to gain priority over the reality they are employed to disclose.

To call terms or statements “kind of” true is once again to make our terms or statements primary over being. To say our terms and statements are rooted in reality places the primary importance upon the reality from which those terms and statements spring and to which they direct us.

Did Torrance himself understand the implications of his position?

It is not clear that Torrance fully understood the significance of his own position. Though he refers to the work of Thomas Kuhn,¹¹³ he never engages with it in any depth. Perhaps he was of the same mind as people such as Lakatos who worried that Kuhn was destroying beloved concepts.¹¹⁴ Regardless of why Torrance refrained from engaging in dialogue with the post-Kuhnian tradition within secular philosophy of science, which was well underway during his academic career, it would seem that his insights might clear up some of the problems which are perceived within that tradition at the time.

Once it is granted that there is a stratification of truth and that theories are not to be judged true or false based on whether they provide a literally true account of reality but by whether they are rooted in a reality that can reveal itself in new and surprising ways, a host of questions can be raised. How does Torrance understand the concrete interaction of theory with reality? In what way do our theories get developed, critiqued, and replaced? How can Torrance's position navigate the problems raised in the debate over scientific realism and anti-realism? These are all questions to be addressed in the next chapter.

113 Torrance's brief engagements with and references to Kuhn's work can be found in *G&R*, 46; *JL&PL*, 31; *R&ST*, 159n; *T&C*, 243, 260n; *TS*, 221n; *G&G*, 47-48.

114 Lakatos, "Falsification," 91-93. However, this seems unlikely, for Lakatos lumps Polanyi with Kuhn as problematic examples and it is well known that Torrance greatly valued Polanyi's thought.

Locating Torrance Historically and Conceptually

Torrance's stress on the priority of being (or reality) over statement places him in an interesting relationship to other thinkers. We shall attempt to locate Torrance historically and conceptually by examining ways that other philosophers have approximated his position on the relation of theory to being in various ways, noting both similarities and differences. This will allow us to locate Torrance conceptually with a self-avowed scientific realist, a self-avowed scientific anti-realist, and an influential philosopher often associated with relativism. In order to achieve this, we shall examine elements of the thought of Roy Bhaskar, Bas C. Van Fraassen, and Ludwig Wittgenstein.

In what ways is Bhaskar similar to Torrance?

It would seem that Roy Bhaskar's philosophy, as articulated in his *Realist Theory of Science*, is the closest parallel to Torrance's thinking within secular philosophy of science. It is for this reason that he has been given a comparatively prominent place in this thesis as a dialogue partner. The close parallels between Bhaskar's understanding of transcendental arguments and Torrance's ultimate and penultimate beliefs was noted in chapter two. Parallels between the way Bhaskar affirms a stratified structure of our conceptions and the way Torrance does will be taken up in chapter five. Here, we are concerned primarily with the clear distinction Bhaskar makes between reality and our statements *about* reality.

Bhaskar believes that a robust realism requires that we not insist that a theory be a literally true account of reality.

We can then allow, for example, that theory T_a is preferable to theory T_b , even if in the terminology of Kuhn and Feyerabend it is “incommensurable” with it, if theory T_a can explain under its descriptions almost all the phenomena $p_1...p_n$ that T_b can explain under its descriptions $B_{p_1}...B_{p_n}$ plus some significant phenomena that T_b cannot explain. We can speak in this way in the meta-language of philosophy; and we must speak so if we are to retain the idea of scientific progress

without falling back on the idea of certain foundations of knowledge or theory-free experience. It is the intuition of this necessity that accounts, I think, for the readiness with which some philosophers of science have embraced Tarski's theory of truth. But this theory cannot help us to resolve the problem posed by the apprehension of the general relativity of our knowledge: viz. that whenever we speak of things or of events etc. in science we must always speak of them and know them under particular descriptions, descriptions which will always be to a greater or lesser extent theoretically determined, which are not neutral reflections of a given world. Epistemological relativism, in this sense, is the handmaiden of ontological realism and must be accepted.¹¹⁵

Bhaskar realizes that, even though Tarski's theory of truth helps us to think on more than one level at the same time, which is required for scientific realism, it does not help us to avoid the fact that we always have a particular point of view and so cannot simply appeal to "the facts" as if reality were self-evident. We must grapple with the necessity that, if we do not want to collapse back into a correspondence theory of truth, we must acknowledge there is a certain relativity that will always characterize our statements about reality. Bhaskar, however, does not hide from this form of relativism. Rather, he embraces it as precisely the kind of epistemological situation we must accept if we are to be realists at a deeper level.

Bhaskar expresses this conviction in a different, though more commonsense context. "For Kepler to see the rim of the earth drop away, while Tycho Brahe watches the sun rise, we must suppose that there is something that they both see (in different ways)."¹¹⁶ That is to say that differing descriptions of experience, if they are to be intelligible, must be descriptions about *something*, even if it is not agreed what it is. The six blind men might very well have all radically misunderstood the elephant and given incommensurate accounts of it, but this does not mean that there are no such things as elephants.

115 Bhaskar, *A Realist Theory of Science*, 248-249.

116 Bhaskar, *A Realist Theory of Science*, 31.

Bhaskar's willingness to acknowledge what could be said to be an anti-realist element in his thought which is implied by his realism makes him very much a kindred spirit to Torrance, even if there are still differences between them.

Are there parallels between the respective approaches of Van Fraassen and Torrance?

It is fascinating to compare Torrance with Van Fraassen. While the former championed the importance of realism throughout his entire career, the latter is quite possibly the most significant and self-consciously anti-realist philosopher of science of the last several decades.¹¹⁷ However, for all their apparent differences, there are some areas of resonance between the two thinkers.

Van Fraassen seems to have no interest in the category of truth in any sense. He claims that truth, as distinct from empirical adequacy, is not what we should be demanding of our theories.¹¹⁸ This raises the question as to exactly what it means when Van Fraassen says that he is an anti-realist. Does he deny that there is such a thing as a reality which science studies or does he merely wish to change the tone of the conversation so that we do not expect scientific theories to carry more weight than they are able to bear? If the former is the case, then there is little hope that Van Fraassen and Torrance will find any common ground. However, if it is the latter, it is possible that they are closer than might at first appear, despite significant linguistic differences.

In order to demonstrate the relative closeness of Van Fraassen with Torrance, we need to make it clear that Van Fraassen, for all his anti-realism, believes that there is a reality that science studies and that this reality is able to challenge our representations of it. It is not clear that more is required given that Torrance would agree that we ought not to imagine that the truth of our statements and theories is the ultimate goal of science. Claiming that our theories are empirically equivalent at a particular point in time is not antithetical to Torrance's realism so long as reality retains the ability to call those theories into question and force their revision.

¹¹⁷ The fact that he is a philosopher of science must be specified because there are surely philosophers in other fields who are more radically anti-realist than Van Fraassen.

¹¹⁸ Van Fraassen, *The Scientific Image*, 10.

This point is easily demonstrated from Van Fraassen's own writing. Van Fraassen explains that Darwinian theory makes the question, "Why does this animal survive while others don't," irrelevant for what matters is not *why* the animal survives but *that* the animal survives; those that are ill-suited for survival simply do not survive.¹¹⁹

In just the same way, I claim that the success of current scientific theories is no miracle. It is not even surprising to the scientific (Darwinist) mind. For any scientific theory is born into a life of fierce competition, a jungle red in tooth and claw. Only the successful theories survive - the ones which *in fact* latched on to actual regularities in nature.¹²⁰

Van Fraassen clearly believes that there exist actual regularities in nature and that empirically adequate theories have managed to latch on to those in some way. Thus it would seem that his anti-realism pertains to our scientific theories and not the reality to which those theories are related.

It is also important to note that Van Fraassen believes that, even on his anti-realist understanding of scientific theories, those who accept a theory, which in his view only involves affirming its empirical adequacy, not its truth, behave as though they "believe" the theory to be true and so their behavior is largely the same as those who actually *do* assert their theories to be true in this fuller sense.

Acceptance has a pragmatic dimension: it involves a commitment to confront any phenomena within the conceptual framework of the theory. A main way in which this shows itself is that the language we talk has its structure determined by the major theories we accept. That is why, to some extent, adherents of a theory must talk just as if they believed it to be true. It is also why breakdown of long-entrenched, accepted theory is said to precipitate a conceptual breakdown, and why it is natural to speak of conceptual revolutions. For in theory change, the logical structure of our language in use may change. However, we are much more flexible in

119 Van Fraassen, *The Scientific Image*, 39.

120 Van Fraassen, *The Scientific Image*, 40.

language use than many philosophers seem to assume: we are quite used to suspensions of belief or of conceptual commitment in dialogue with adherents of theories which we personally do not accept. This prepares us for such eventualities - it is noteworthy that radical as scientific revolutions have been, and confused as concepts and language sometimes became, scientists never became tongue-tied, but always successfully (if gradually) adapted their language to the changing tides of theory.¹²¹

The use of the term "model" in the preceding quotation requires a bit of elucidation. Van Fraassen uses meta-geometry to explain the distinction between a theory and a model *of* that theory.¹²² A theory is made up of statements or convictions, or axioms in geometry, but these components do not uniquely define particular expressions of those components. "Any structure which satisfies the axioms of a theory...is called a *model* of that theory."¹²³

Let us consider the following statements to be the "axioms" of Van Fraassen's Constructive Empiricism:

- (1) Acceptance of a scientific theory means only that it is believed to be empirically adequate.¹²⁴
- (2) Our theories are to be understood literally and not metaphorically.¹²⁵
- (3) New phenomena may come to light that require revision of our theories.¹²⁶

If these statements give an acceptable description of the basic features of Constructive Empiricism, then we could say that Torrance's realism is an acceptable *model* of Van Fraassen's theory.

121 Van Fraassen, *The Scientific Image*, 202.

122 Van Fraassen, *The Scientific Image*, 41-44.

123 Van Fraassen, *The Scientific Image*, 43.

124 Van Fraassen, *The Scientific Image*, 12.

125 Van Fraassen, *The Scientific Image*, 10.

126 Van Fraassen, *The Scientific Image*, 81-82. Van Fraassen speaks of our conceptual framework changing and that we cannot go back to previously held theories because of new data. That this implies a kind of Polanyian reality will be fleshed out in more detail below in the context of Wittgenstein's thought.

There is a difficulty with this interpretation, which will be made clear in chapter five. Torrance's realism refuses to remain entirely silent on the question of truth. However, this linguistic difference is not as dramatic as it might appear. Torrance's understanding of truth, as we have seen, is relatively unconcerned with the "truth" of our theories. He is far more concerned with the truth of being and with whether our theories are rooted in reality. In light of these considerations, the difference between Van Fraassen and Torrance is not so great after all. The "truth" Van Fraassen is trying to avoid is not the "truth" that Torrance insists must be retained. If Constructive Empiricism is able to grant that we may live in a "Polanyian" world, where that which lies beyond our theories possesses the capacity to reveal itself in ways that cannot be anticipated by our theoretical constructions, then we are not far from Torrancean realism.

Indeed, it seems that, with this kind of presentation, Van Fraassen's model needs little modification to accommodate a Torrancean realism. In Van Fraassen's own words,

To believe a theory is to believe that one of its models correctly represents the world. You can think of the models as representing the possible worlds allowed by the theory; one of these possible worlds is meant to be the real one. To believe the theory is to believe that exactly one of its models correctly represents the world (not just to some extent, but in all respects).¹²⁷

Thus, it would seem that, to the degree that it is accurate to describe Torrance's realism as a model of Constructive Empiricism, there is an element of irony, for it would mean that one of the great anti-realist perspectives allows for a robustly realist interpretation.

How can Torrance be located relative to Wittgenstein?

Few thinkers loom as large in twentieth century philosophy as Ludwig Wittgenstein. Many of Torrance's books contain a reference or allusion to the thought of the earlier Wittgenstein. In almost every case, it takes a form similar to, "It is impossible to picture how a picture pictures what it pictures, without reducing the reality pictured

127 Van Fraassen, *The Scientific Image*, 47.

merely to a picture of it."¹²⁸ Torrance prefers to change the idiom by saying that "No more can we state in statements how statements are related to being, without reducing the relation of statements to being entirely to statements."¹²⁹ It is a crucial insight that has many connections with Torrance's thought. It is evidence of his rejection of a strict correspondence theory of truth, it is connected with his insistence on a distinction between "truth" and "truthfulness," and the importance of what I have elsewhere called a "semantic relation"¹³⁰ between sign and thing signified.

Though Torrance alludes to the earlier Wittgenstein frequently, his perspective on scientific realism makes one want to ask what he thought about the later Wittgenstein, whose thought has been called a "salutary influence" toward relativism.¹³¹ Torrance writes so little on, or even alluding to, the later Wittgenstein that it is somewhat difficult to give a definitive answer. However, there is one passage that seems illuminating.

Wittgenstein had rather similar problems [as Heidegger]. He too made very important contributions to modern philosophy, not least in his analysis of the function of language, and certainly in his later thought he stands apart from many of his would-be followers, but it would be difficult to absolve him from serious mistakes that keep on cropping up in the various stages and forms of the linguistic philosophy, and not least the inveterate nominalism that is evident in the substitution of "linguistic statements" for "physical statements," or in the reduction of empirical statements to the relations of statements.¹³²

128 *T&C*, 304. Paraphrases of this statement can be found in *G&R*, 36; *R&ET*, 73; *R&ST*, 143; *T&C*, 318; *TReconstr*, 56. This is noted by Torrance in *TS*, 24, as being a reference (though perhaps paraphrase would be more appropriate) to Ludwig Wittgenstein, *Wittgenstein's Tractatus*, 4.12.

129 *T&C*, 304. Paraphrases of this statement can be found in *PCT*, 44; *R&ET*, 73; *R&ST*, 143; *T&C*, 318; *TReconstr*, 56; *TS*, 143, 223, 272; *ST&R*, 77.

130 Travis M. Stevick, "Truth and Language."

131 Christopher Norris, *Against Relativism: Philosophy of Science, Deconstruction, and Critical Theory*. (Oxford: Blackwell, 1997), 71.

132 *T&C*, 319. It could be contended that the later Wittgenstein's nominalism is less the *denial* of universals and more the conviction that we can never articulate our *knowledge* of a universal in a way that unambiguously distinguishes it from other universals. This point seems to be taken

Though the rest of the paragraph, to which we shall return, somewhat softens this appraisal of Wittgenstein it seems clear that Torrance is not pleased with what seems to him as Wittgenstein's decidedly anti-realist turn. Indeed as it appears that no interaction with the later Wittgenstein of even a cursory nature occurs after this passage was written,¹³³ it would seem that Torrance's suspicions of Wittgenstein's position prevented him from further dialogue.

It must be asked, however, whether this criticism is valid. There is no question as to the fact that Wittgenstein's thought has often been pressed into the service of anti-realist and relativist arguments alike.¹³⁴ There is little doubt that, if one were to take a strong stance against such movements, Wittgenstein would certainly be guilty by association. However, the later Wittgenstein's thought does not *necessarily* imply such positions.

The passage quoted above, critical of the later Wittgenstein's supposed anti-realism, is immediately followed up with a consideration of what we might learn from Wittgenstein [and Heidegger] if we assume that they had more realist intentions than some of their followers would have us believe. If that is so, we can learn

about the need to distinguish the truth of being from the truth of statement, for unless the truth of statement is grounded beyond itself in the truth of being it can quickly replace the truth of being altogether. It does not follow, because a true statement about the truth must be distinguished from the truth of being to which it refers, that it is not objectively grounded in that truth.¹³⁵

That is to say, one might say that anti-realist interpreters of Wittgenstein take the point, which is extremely important, that the truth of statement must be distinguished from the truth of being (Wittgenstein did not use these words; perhaps he would have said that the word must be distinguished from its so-called "meaning"), and interpreted it to

seriously by Michael Polanyi, *Knowing and Being*. (Chicago: University of Chicago Press, 1969), 166, 190-191.

133 This is not only true of the date of publication of *T&C* (1984), but also with respect to the date of the paper from which the chapter originated (1969).

134 This reading has been so common that one can speak of "Wittgensteinian fideism."

135 *T&C*, 319.

imply that statements can be utterly separated from what they speak of. Torrance will grant the former, which is clearly present in the later Wittgenstein's thought, but rejects the latter.

But is the latter appropriate to the later Wittgenstein's own thinking? It would appear that this is not the case. As was stated above, it is fairly easy to interpret the later Wittgenstein in a relativistic way, where each community's language and way of life determine what "truth" is for them. However, this is not the only documentation of Wittgenstein's later thinking that we have. If one examines his work, *On Certainty*,¹³⁶ one finds significant passages that imply that such an ontologically relativistic viewpoint is an inappropriate imposition on Wittgenstein's thought.¹³⁷

There are places in *On Certainty* where it certainly seems as though Wittgenstein speaks of "truth" and "falsity" as nothing more than their roles within a given language game,¹³⁸ which would seem to be in contrast to Torrance's insistence on realism. However, Torrance is every bit as capable of speaking in this way, such as when he speaks of a "primitive" person calling a watch an animal¹³⁹ or Newtonian physics being valid "on its own level."¹⁴⁰ The fact that every person always and everywhere speaks from within a particular set of ultimate beliefs that so condition what we can think that they must be critiqued in a fundamentally different way than inconsistencies within a given framework of thought is well-noted by Torrance and acknowledged by Wittgenstein.¹⁴¹

The claim that Wittgenstein and Torrance are necessarily at odds is only valid if it can be shown that this is the *only* way Wittgenstein speaks of truth and falsity, and this is not the case. Specifically, Wittgenstein speaks of language games *changing*, the

136 Ludwig Wittgenstein, *On Certainty*, edited by Anscombe, G. E. M., G. H. von Wright. (New York: Harper Torchbook, 1972).

137 The fact that *On Certainty* was published after Wittgenstein's death, and thus does not bear his final stamp of approval, is of no consequence as the same is true, though to a lesser extent, of *Philosophical Investigations*.

138 Wittgenstein, *On Certainty*, §80-83, §94, §199.

139 *TS*, 171.

140 *G&G*, 103.

141 See Wittgenstein, *On Certainty*, §103, §152.

bare acknowledgement of which topples the conflict between himself and Torrance, or nearly so at any rate.¹⁴² Consider the following passages from *On Certainty* (numbered for easier reference below):

(1) If we imagine the facts otherwise than as they are, certain language-games lose some of their importance, while others become important. And in this way there is an alteration - a gradual one - in the use of the vocabulary of a language.¹⁴³

(2) When language-games change, then there is a change in concepts, and with the concepts the meanings of words change.¹⁴⁴

(3) I do not say that [G. E.] Moore could not convert the king [who believes the world to have existed only a short time before his birth] to his view, but it would be a conversion of a special kind; the king would be brought to look at the world in a different way.¹⁴⁵

(4) If someone said to me that he doubted whether he had a body I should take him to be a half-wit. But I shouldn't know what it would mean to try to convince him that he had one. And if I had said something, and that had removed his doubt, I should not know how or why.¹⁴⁶

(5) Where two principles really do meet which cannot be reconciled with one another, then each man declares the other a fool and heretic.¹⁴⁷

(6) Certain events would put me into a position in which I could not go on with the old language-game any further. In which I was torn away

142 David Munchin, *Is Theology a Science?*, 119, cites that D. Z. Phillips saw that this is *exactly* the issue at stake. Whether Phillips was correct in his development from that point is a different issue altogether.

143 Wittgenstein, *On Certainty*, §63.

144 Wittgenstein, *On Certainty*, §65.

145 Wittgenstein, *On Certainty*, §92.

146 Wittgenstein, *On Certainty*, §257.

147 Wittgenstein, *On Certainty*, §611.

from the *sureness* of the game. Indeed, doesn't it seem obvious that the possibility of a language-game is conditioned by certain facts?¹⁴⁸

Statements such as (1) and (2) speak of language games changing in various ways. For one who hopes to find in Wittgenstein an ally to relativism, they raise the question, "From whence does this change come? How does it come about that language games change?" If one were to respond that language games can be challenged by their inability to account for particular facts of the empirical world, it must be granted that there exists an external reality that is so far undetermined by the language and life of the community that the latter can be challenged by it.¹⁴⁹ Once this is granted, Torrance's position can be accepted in its full force, for Torrance does not for a moment imagine that being a "realist" implies a correspondence of each of our terms with an element of reality. Rather, realism is a conviction that reality is far deeper and richer than our terms can describe and, as such, continues to stand against us and our concepts.¹⁵⁰ The abandoning of a language game due to external pressures (facts) in statement (6) implies the same conclusion, if somewhat more explicitly.

Rather than posit something in the natural world that changes a language game, one might prefer to account for the change in communal terms, such as the interaction of one community with another. This example is as good as the previous one, for it means that there exists a *second community* that is so far undetermined by the first one that it can present an alternative cultural-linguistic framework which has the possibility of bringing about a change in the framework of the first community or vice versa.¹⁵¹ The language game is not absolute, but can be modified by outside influences, again making way for Torrance's realist convictions, even if not those of other so-called realists.

148 Wittgenstein, *On Certainty*, §617.

149 The persistence of the value of Planck's constant, h , in opposition to the expectations of the scientific community might serve as an example of such a fact which radically changed the language game of physics at the time.

150 This is similar to Polanyi's definition of reality.

151 An example of this might be the influence of a conquering culture on the language and culture of the conquered people or, alternatively, the influence of a conquered people on that of the conquering people.

Statements (3) through (5) deal with the issue in the philosophy of science of incommensurability. Statement (3) speaks of two paradigms, one where the earth is quite a bit older than a person and one where it is barely older than the person. They are not identical and the differences have far-reaching implications, such as for understanding and interpretation of history.¹⁵² However, for all their disagreement, people who hold to the two paradigms can speak to one another and can attempt to persuade each other. We cannot articulate precisely what goes on when one is persuaded in this way, though it is interesting that Wittgenstein uses the religious term "conversion." However, arguments or facts can press up against a language game in such a way that it is eventually modified or abandoned. This could not happen if those who advocate for a radically relativistic perspective relying upon the absolute character of language games are correct.

Incommensurable theories can be seen as utter roadblocks in the way of communication. However, it is not always as dramatic as that. Statement (3) is an example of two views that are incommensurable, but not entirely so. They are not identical and cannot even be translated into one another, but there is still sufficient common ground to attempt persuasion. Statements (4) and (5) are examples of what might be called "total incommensurability," two ways of viewing the world and interpreting experience that are so radically different that they cannot even speak intelligibly to one another. Both circumstances are seen as having no hope for reconciliation. How does one become convinced that they have a body if they are not convinced by their own experience of having one? How can a conversation take place when the language games of the parties involved are so incommensurate that the only option they have is to interpret the other as one who has no faculty of reason or as one who is intentionally distorting the truth? The point to be gleaned from these statements is that the kind of incommensurability that would need to be the case in order to justify a position of anti-realism in the sense of true ontological relativism is relatively rare,¹⁵³

152 Wittgenstein, *On Certainty*, §185.

153 Bhaskar, *A Realist Theory of Science*, 258, suggests that even Feyerabend did not affirm the possibility of "total Kuhn-loss," which he associates with incommensurability.

is the exception rather than the rule and such a position makes the mistake of taking the special case as the paradigmatic example.¹⁵⁴

It would seem that the later Wittgenstein did not imagine that language games were to be interpreted in a fully relativistic way. Though language games color our understanding of everything we encounter, they are not immune to critique and may prove to be inappropriate, in which case they either become modified or abandoned. This was precisely what we saw in the discussion of ultimate and penultimate beliefs.¹⁵⁵

Wittgenstein stretches his notion of a language game further than terms are stretched in Torrance. For example, where Torrance will speak of ultimate beliefs, of different sciences with different objects and research methods, and of disclosure models, Wittgenstein uses just the one concept of a language game.¹⁵⁶ Torrance once remarked that Wittgenstein's use of terminology associated with "vision" to describe language was unfortunate and led to his being misunderstood.¹⁵⁷ Torrance is no stranger to using a term with such interpretational baggage that it becomes difficult to understand.¹⁵⁸ It seems that the fruit that might have come from a more extensive dialogue with Wittgenstein was never realized due to the misinterpretation of others.

As we have seen, Torrance's distinction between the truth of statement and the truth of being has a strong parallel in Bhaskar's realist theory of science but is also compatible with both Van Fraassen's Constructive Empiricism and Wittgenstein's language games. This unusual relationship with both so-called "scientific realism" and

154 The long tradition of foundationalism is evidence that taking a special case (such as mathematics) and imposing it as the standard by which we judge can have disastrous consequences.

155 Again it should be remembered that it can never be proved that a belief is *ultimate*, only penultimate and this judgment can only be made *a posteriori*. This is not unlike the fact that we can never know whether a theoretically problematic phenomena will turn out to be an anomaly or a counter-instance (to use Kuhn's language), we can only know that it was a counter-instance after a revolution has taken place or that it was an anomaly after it is successfully explained within the paradigm. There is no way to tell, *a priori*, whether something is an anomaly or a not-yet-exposed counter-instance.

156 It could be argued that Torrance's concept of a "disclosure model" is every bit as flexible as Wittgenstein's language games, but Torrance himself does not often use it that way.

157 *TS*, 24.

158 Such seems to be the case with the ongoing discussion as to what, exactly, Torrance meant by "natural theology."

"scientific anti-realism" leads us to consider precisely what role theories play within the natural and theological sciences.

5. What is the role of theory in Kataphysic knowledge?

It was claimed in chapter four that, for Torrance, the primary purpose of theories in the natural and theological sciences is not to tell a "literally true story of what the world is like," but rather to facilitate our contact with, and participation in, reality.¹

This seems to flow inescapably from Torrance's other concerns already explored. For Torrance, authentic knowledge is knowledge according to the nature of that which we seek to know. However, this knowledge is shaped by our beliefs. Some of these beliefs are ultimate, forced upon us by the nature of reality itself, but some of them are *penultimate* beliefs which allow of alternatives, though we are often in no position to make a rational case as to why we should believe one rather than another. In cases such as this, we cannot merely appeal to the reality itself, since our knowledge is not objectivistic knowledge but always involves the subject-object relationship, though the subjectivity that would seem to be inherent in such a relationship can be kept in check through various means. According to Torrance we have to allow the nature of things to dictate a new understanding of objectivity. Rather than thinking out objectivity in terms of the knowing subject, we must think it through in terms of the object itself. This means that we highlight and remain dedicated to the object's right and capacity to *object* to us and our formulations. This, in turn, has made us pay careful attention to how our statements are related to being and exactly what we mean when we say that our theories "refer" to things or that theories might be "true."

The claim that "true" is a term more appropriately applied to realities than to our statements *about* those realities requires an analysis of what is meant when it is claimed that statements or theories are true. For Torrance, the truth of statement means more than the mere "validity" or "logical consistency" of a strict coherence theory of truth. Additionally, our theories and statements must also direct us to a reality that transcends them and their ability to describe it.

¹ Again, "participation" in Torrance is never Platonic in nature.

What kind of theories/models are demanded by Torrance's notion of truth/reality?

While this conclusion seems to be required if Torrance is to be consistent with his other epistemological convictions, it is not immediately clear as to how the natural and theological sciences are to proceed with their empirico-theoretical engagement with their objects of study for Torrance. They do so by adopting a flexible, inherently reviseable manner of investigation that is conscious as far as possible of its presuppositions and is self-correcting of them. Torrance calls the models we develop in such investigation "disclosure models."² This is a culmination of the issues discussed so far, but it is also an insight that carries with it a variety of important considerations.

What Torrance calls disclosure models are perhaps most clearly articulated in two passages that do not use the term.

In the process of question and answer in some field, we find imposed upon us a new and enlightening form which we judge to be an important intimation or essential clue to the reality we are investigating. We make it central and organize the other forms round it in a harmonious pattern of reference. Then we imaginatively and tentatively project that as a hypothesis and put it as a complex question to the reality we are investigating in such a way that the answer is clearly intuited, and so once again in the light of what is revealed we proceed to reconstruct it. We clarify and sharpen its focus as an act of interrogation, we simplify and unify its conceptual form, in the hope that it will become such a transparent medium for our apprehension that our thoughts will fall under the power of the logic or the interior connection in the components of reality itself. This is the theory or "mechanism," what we now call a

2 The key discussions on disclosure models can be found in *R&ET*, 49-51; *R&ST*, 85-86; *G&G*, 124-127. See David Munchin, *Is Theology a Science?: The Nature of the Scientific Enterprise in the Scientific Theology of Thomas Forsyth Torrance and the Anarchic Epistemology of Paul Feyerabend*. Studies in Systematic Theology., edited by Bevans, S. V. D., Miikka Ruokanen. Vol. 7. (Leiden, The Netherlands: Koninklijke Brill, NV, 2011), 227-233, for a discussion on "fluid axioms" that are deeply related to disclosure models. Indeed they are largely just a different angle on the same topic.

“model,” or better still an “analogue” (especially for the more concrete and less mechanical sciences),³ but it remains only an instrument of reference in the successive advances of our cognitive interrogation, a kinetic model or analogue that is to be “operationally defined” (in Einstein’s sense), and must never be allowed to become fixed or rigid for that would suppress its intended function in discovery.⁴

As we direct our questions to our chosen field we allow it to disclose itself to our inquiry, and as that takes place we proceed to question our initial questions, and then we pose our revised questions to the field and in the light of what further becomes disclosed we requestion our prior questioning, and so on. Thus scientific inquiry operates in such a way that it cuts back constantly into ourselves the questioners, in order to invert the determining factor from ourselves to what we seek to know. This is why rigorous scientific inquiry far from being some sort of impersonal progression of induction is a highly distinctive movement of interaction of the inquirer with the object, in which acts of personal self-criticism and personal judgment are called for all through the process of distinguishing what we know from ourselves and of checking the illegitimate projection of ourselves, our subjective states and conditions, into what we seek to know.⁵

The simplest and clearest way to describe how disclosure models function in our scientific endeavors is as a lens⁶ *through* which we look at

3 Torrance notes in a footnote that “analogue” might be the more appropriate term, though it is interesting that he eventually drops the term and tends to stick with “disclosure model” in his later works.

4 *TS*, 239-240.

5 *R&ST*, 26-27.

6 *R&ET*, 50. It seems that this is related to one degree or another to Calvin’s comparison of the scriptures to spectacles, that is, something to look *through* (rather than *at*) to discern the truth. John Calvin, *The Institutes of the Christian Religion*. Translated by Battles, Ford Lewis, edited by McNeill, John T. (Philadelphia: Westminster Press, 1960), I.6.1. Torrance makes this comparison

reality.⁷ When we first engage with a particular facet of reality, we often do not grasp it in its depths with our understanding.⁸ It is as if we were looking through a lens that is not yet properly calibrated; the object is there, but seems distorted or blurry. Because of this, our first ways of understanding a thing may turn out to be particularly inadequate. However, this does not mean that this first way of understanding is not a very helpful step toward deeper knowledge; in fact, as we shall see, it may be indispensable. We take initial clues and organize these and the insights to which they give rise as a model of what we seek to know. It is extremely likely that, while using this model as a tool by which we understand a facet of reality, we shall come to the realization that our model is significantly inadequate to reality.⁹ This often manifests itself in the empirical correlates posited by the theory or model not being actualized in the appropriate circumstances. One example of this is the rotation of the perihelion of Mercury, an empirical phenomenon that was different than was expected by the Newtonian worldview. When this happens, the disclosure model must be broken down and revised.

There are some similarities here with Karl Popper's theory of falsification, where we advance in knowledge by freely positing theories and putting them rigorously to the test. While Torrance's position sees the value of falsification and insists on theories being falsifiable to one degree or another through their empirical correlates, his position differs sharply from Popper's inasmuch as it is more deeply realist. For Torrance, in spite of the fact that there is no way to construct a logical bridge between

explicit in a lecture. "Ground and Grammar of Theology, Lecture 2 Q&A." Grace Communion International, accessed March 18, 2014, (<http://gcity.net/download/MiscVid/TorranceGrammar-Tape2-QA.mp3>) at 1:05:00.

- 7 Torrance is very aware of the tendency, as evident in chapter 4, to focus on statements rather than using statements as transparent media through which to discern reality and issues warnings against it. See chapter 4, footnotes 78 and 88.
- 8 It must be remembered that this engagement is always within the subject-object relation.
- 9 The qualifier "significantly" is important here. *All* our models are, strictly speaking, inadequate to reality. The inadequacy we are speaking of here is an inadequacy where the shortcomings are more than trivial deviations from reality. That is to say, they are *significantly* inadequate.

reality and our theoretical representations of it or render such a relation entirely explicit, there is still a real, though unspecifiable, connection.¹⁰ Our disclosure models, to whatever degree they are rooted in reality, are the result of the inherent intelligibility of reality impressing itself upon our minds. That is to say, though the development of our theoretical tools is non-logical (or extra-logical, though never *illogical*) and is free in the sense of Einstein's "free inventions," they are *not* free in Popper's sense.¹¹

Does Torrance believe that our theories are stratified?¹²

So far, we have encountered two distinct occasions where we have had to take note of stratification inherent in our engagement with reality. The first of these was that the complexities of reality require a stratification of sciences and not just a single science.¹³ Each of the sciences are bound to each other by virtue of the fact that their objects are bound to each other; that is, what we study in biology is dependent, to a degree, on what we study in chemistry, which is in turn dependent, to a degree, on what we study in physics, and each science must be open to levels "above" them. For example, we shall be misled if we imagine that an increased heart rate should be explained only on the bio-chemical level to the exclusion of the fact that a long awaited letter has just arrived. However, we must not imagine that we can reduce one science to another without remainder. Each science must be preserved in its own integrity to do justice to the stratification of reality.

10 Torrance's criticism or rejection of the idea of a logical bridge between our theories and reality can be found in *D&CO*, 34, 112; *JL&PL*, 50-51; *R&ST*, 41, 49-50, 56-58, 76; *T&C*, xi, 79-80, 111-112, 178; *G&G*, x-xi, 21-22, 80-82, 85.

11 See Chapter 4, footnote 84.

12 The most important discussions on this topic in Torrance are found in *G&G*, 156-159 and *CDG*, 82-88. Also, see my discussion in Travis M. Stevick, "Truth and Language in the Theology of T. F. Torrance." (*Participatio* 2 (Supp. Vol.), (2013): 67-101).

13 Chapter 1.

The second stratification was the stratification of the truthfulness of our statements, the truth of being and the Supreme Truth of God.¹⁴ From a slightly different angle, we could say that this is a stratification of epistemology, the ontology of creation, and the ontology of God. Regardless of how it is rendered, it means that our statements rely upon the reality to which they refer for their validity and authority and that being itself, in order to be what it is and not something else, relies upon the God who created it. Even though there is a necessary openness of each level to the level or levels "above" it, we may not reduce one level to another without remainder;¹⁵ for example, committing what Bhaskar calls the "epistemic fallacy," which is the belief "that statements about being can always be transposed into statements about our knowledge of being."¹⁶

Having considered stratifications between reality and our knowing of it and between the sciences, there is a third stratification that we must take seriously and this is the stratification of our theories *within* a given science. When engaging with reality, we do not think only on one level at a time. Indeed, to forget that all knowledge is multi-layered is to reduce science into absurdity, as absurd as the doctrine of the Trinity becomes if we imagine that when we say God is three, we mean it in exactly the same way we do when we say that God is one. Like the other stratifications, these levels are connected and open to one another but not reducible to one another. Torrance provides an account of three levels, not because there are only three levels possible but because most sciences do not require more than three levels.¹⁷ It should be noted that, where

14 Chapter 4.

15 John Douglas Morrison, *Knowledge of the Self-Revealing God in the Thought of Thomas Forsyth Torrance*. (New York: Peter Lang, 1997), 88, expresses it this way. "Torrance describes the relation and process in the interactive levels as that of refinement and extension and continued relation whereby each level is 'open up' to the next and disclosive 'down.' No level 'below' has its truth in itself, but is true to the extent that it is open 'up' to the refinement and greater consistency found in the interactive found at the higher level, and that level is refined at the next higher, etc., all being grounded finally beyond the contingent in that sufficient reason for the contingent order of rationality and intelligibility 'below' it."

16 Roy Bhaskar, *A Realist Theory of Science*. 3rd ed. (London: Verso, 2008), 16.

17 Additionally, Einstein's essay that Torrance draws from describes three levels (see following footnote).

Torrance speaks of this stratification, it is often within a distinctly Christian context, most usually when speaking of the doctrine of the Trinity. In exploring this aspect of Torrance's thought, I shall use the terms that we find in his works and also provide terms whereby his insights can be appropriated in a larger scientific context, including the natural sciences.¹⁸

The first level of our theoretical development is at our basic engagement with reality. When accounting for the development of the Christian doctrine of the Trinity, Torrance calls this the "evangelical and doxological level,"¹⁹ though if we were to take that Christian conviction and generalize it to all knowledge, we might call it the "empirico-theoretical level." At this level, we are concerned with our basic, holistic and organic encounter with reality. In theology, this takes the form of reading and meditating upon the scriptures, prayer, worship in the church and the life of faith and discipleship, including obedience.²⁰

To say that the most basic level of our knowledge is not just empirical but empirico-theoretical is to say that Torrance will have nothing to do with any notion of scientific knowledge that sees itself as being able to separate empirical and theoretical elements.²¹ As was discussed earlier, Torrance believes that even in our most basic experience we are not operating in isolation from theoretical convictions.²² It is true that

18 The application of this line of thought to the natural sciences is entirely appropriate, not least because one could make a very strong argument that, when Torrance explicates the three levels, it is an extended exposition of and commentary on, the section in Einstein's essay, "Physics and Reality." In *Out of My Later Years*, 59-97. (New York: Philosophical Library, 1950), titled, "Stratification of the Scientific System," 63-65.

19 Torrance's discussions of this level can be found in *G&G*, 156-157; *CDG*, 83-84, 88-91.

20 Thomas A. Langford, "T. F. Torrance's Theological Science: A Reaction." *Scottish Journal of Theology* 25, (1972): 155-70, 157-158, writing fairly early in Torrance's career, was concerned that obedience did not play enough of a role in Torrance's theology. While it never becomes a controlling concern for exposition, it is clear that it is not seen as unnecessary in light of Torrance's understanding of ultimate beliefs, objectivity and the need to allow the gospel to impact every facet of life.

21 *T&C*, 115. Morrison, *Knowledge of the Self-Revealing God*, 7, also notes the importance of empirico-theoretical investigation.

22 Chapter 2.

these convictions are largely tacit at this level and that it is not easy, and may not be possible, to specify where and how theory is playing a role in our experience at any point in time, but that is not to say that empirical and theoretical factors are identical. To use the terminology of the philosophy of science, all of our observations are theory-laden, but that is not to say that they are utterly theory-determined.²³

The second level of our theoretical development is what Torrance calls, in the development of the doctrine of the Trinity, the "First Theological Level,"²⁴ but might be generalized to say that, in any science, we are moving to the "First Theoretical Level." Of course, as has been made clear from the preceding discussion, this naming is not meant to imply that the first level is theory-free. Rather, it is to emphasize that this is the level where we move beyond an *inchoate* theory to a formulation that is explicitly and self-consciously theoretical in nature.²⁵

What we do at this second level is to attempt to organize our experience and observations at the first level into some kind of unified account of the reality that gave rise to those experiences and observations. To put this task in the language of the philosophy of science, we set about constructing a theory that accounts for the experiences that obtained at the first level. "The purpose of such a theory is to enable us to penetrate into the intelligible connections latent in reality that ground and control our basic experiences and cognitions, and illuminate them for us."²⁶ It is important to note that it is inaccurate, in both natural and theological science, to portray the theories that develop at this level as if they were "literally true" accounts of the world.

As should be clear from everything leading up to this point, Torrance is well aware of the fact that we do not leap directly from our basic experience or apprehension of God or some created reality to a fully formed and accurate theoretical construction.²⁷ There is no way to guarantee that our move from the first to the second levels will get us anywhere close to a "literally true" account of reality. Indeed, one of the first great attempts at unifying a field of experience in the modern era was that of Francis Bacon

23 Torrance refers to "theory-laden experiment" in *G&G*, 45.

24 Torrance's discussions of this level can be found in *G&G*, 157; *CDG*, 84-85, 91-98.

25 *TS*, 10.

26 *CDG*, 84.

27 The fact that our theories/models change over time is evidence of this.

in his *Novum Organon*, where he attempts to understand the phenomenon of heat.²⁸ A modern reader may be struck by how someone who played such a major role in the development of empirical science could be, from our current perspective, so far off the mark. However, even *this* attempt is shown to be rooted in reality inasmuch as we have not abandoned the idea that there *is* something that is indeed true about all things that radiate heat. That insight has been made all the more secure, though we might speak about it today in significantly more refined terms.

These considerations, however, do not change the fact that we *do* move to the second level and that we *do* achieve *something* by doing so, even if it is discovering how wrong we were. To the degree that we can learn, not only from our successes in theoretical construction but also from our failures, there would seem to be a resonance between Torrance on this point and the kind of critical rationalism advocated by Karl Popper. For Torrance, refutations have epistemological value, even if they are not our goal. In direct response to Popperian falsificationism, Torrance takes issue with Popper's insistence that we ought to *invite* the harshest criticism we can find for our theories. "Such an effort *risks* defeat but never *seeks it*; it is in fact his craving for success that makes the scientist take the risk of failure. There is no other way."²⁹ Indeed, it seems that it is because of the conviction that reality will "teach" us, even when we misread it that we continue to pursue science in different fields, in spite of repeated failure.

The first step to be taken here, then, is rather similar to that of which Einstein and Polanyi have spoken in their own spheres of scientific inquiry, namely, an empirico-intuitive movement of thought in which we

28 Francis Bacon, *Novum Organum: With Other Parts of the Great Instauration*. Translated by Urbach, Peter and John Gibson, edited by Urbach, Peter, John Gibson. (Chicago: Open Court, 1994), Book II, Aphorism XI.

29 *T&C*, 121. For the kind of statement of Popper's that Torrance is opposing, see Karl R. Popper, *Conjectures and Refutations: The Growth of Scientific Knowledge*. Fourth (Revised) ed. (Frome and London: Butler & Tanner Limited, 1976), 51. "If we have made this our task, then there is no more rational procedure than the method of trial and error - of conjecture and refutation: of boldly proposing theories; of trying our best to show that these theories are erroneous; and of accepting them tentatively if our critical efforts are unsuccessful."

cultivate incipient insights into the objective patterns or configuration of our chosen field. These are what we call clues, informal glimpses of reality, pointers to reality, or aspects of reality pressing for recognition in our minds. As we have seen, they are essentially of an anticipatory nature, anticipatory because they come from reality and draw us toward it. There are no formal rules for acquiring these enlightening intimations of reality. Only the great theologians who were also childlike in spirit have been able to come up with the basic insights and fundamental ideas that have advanced theological understanding.³⁰

Torrance calls this anticipatory grasp of some important aspect of the object a "prolepsis" or a "proleptic grasp."³¹ According to Polanyi, this notion of a "prolepsis" or a "tacit foreknowledge" is a solution to the Platonic problem of learning in Plato's *Meno*.³² It is a way of (tacitly) knowing before (explicitly) knowing. It is something that is highly personal, extra-logical and unformalizable. Indeed, it is the reason why the process of discovery is so entirely unpredictable. However, it is because of this intuitive leap forward in response to reality impressing itself upon us that we are able to take a step into the unknown and discover things that we had as yet not been able to tell ourselves.³³

30 *R&ST*, 83-84. Albert Einstein and Leopold Infeld, *The Evolution of Physics: The Growth of Ideas from the Early Concepts to Relativity and Quanta*. (Cambridge: Cambridge University Press, 1938), in a work pointed out to readers in Torrance's *CFM*, use the term clues (or rather "clews") to describe how science moves forward. Polanyi's book, *The Tacit Dimension*. (Magnolia, MA: Smith, 1983), speaks of "tacit foreknowledge" which seems to be the element of his thought which Torrance is referring to. 22-23, 30, 76.

31 In spite of Torrance's explicit mentioning of Einstein and Polanyi in the above quotation, it is clear that he traces the basic conviction, as well as the terminology, to Clement of Alexandria. Torrance connects the idea of a prolepsis to the thought of Clement in *DM*, 131, 141, 176-177; "TR," 192; *T&C*, 197-198.

32 Plato, *Meno*. Translated by Sharples, R. W., edited by Sharples, R. W. Warminster, (Wiltshire: Aris & Phillips Ltd., 1985), 80e.

33 This kind of forward motion can be found in *T&C*, 88-89; *TS*, 229-230.

With the move from the second level to the third level or Second Theological/Theoretical (or meta-scientific) Level,³⁴ we are, in a sense, doing something similar to what we did with the move from the first level to the second. The difference is that now, instead of looking primarily to the mass of detail inherent in our empirico-theoretical engagement with reality, we are dealing primarily with our explicitly theoretical treatment of it. Our goal in this transition is to probe more deeply into our field of study, to discern the most important factors of that field and to distill our theoretic representation to achieve a maximum of logical simplicity and comprehensive applicability. That is to say, we hope to have as few concepts as possible and be able to explain as wide a range of experiences as possible.

It is important to note, both for its significance in itself as well as its implications for further dialogue below, that Torrance sees the third level as being inescapably concerned with ontological claims. In his favorite example of the Christian doctrine of the Trinity, the transition to the third level involves answering questions about the actual being of God and not merely questions about God's interaction with us. That is to say that, for Torrance, it is not possible to move to the third level in our theoretical development without making concrete ontological claims. We cannot have third level theories and yet fail to make affirmations at the level of being.

It must be said that this account of these three levels within our scientific activity is not something that is self-evident, but it is an *a posteriori* reconstruction made on reflection of what has actually taken place over the centuries.³⁵ Torrance himself grants this and makes no apology for it. Indeed, for Torrance, it would be methodologically inappropriate to attempt to specify ahead of time how theories *must* develop if they are to be valid. The only appropriate way to analyze such theories is *a posteriori*.

The connection between these three levels, and any others if they would happen to be needed, is again one of *correlation*. There are, and must be, points of overlap between the levels of our theories. If there were no such overlap and the levels were

34 Torrance's discussions of this level can be found in *G&G*, 157-159; *CDG*, 85, 98-101.

35 Torrance cites Einstein as calling the task of natural science to be "the posterior reconstruction of existence by the process of conceptualisation." *CT&SC*, 7.

utterly separate, then they would have nothing to say to one another. For example, in pre-Socratic philosophy, there was a tendency to develop cosmologies that had nothing, or very little, to do with the world that is actually experienced by human beings due to the excessive rationalism that characterized ancient Greek thought.³⁶ This made such theories interesting as an intellectual exercise but of little use as far as engaging with the world in which we live. If our theories are to have any bearing on empirical reality, they must be connected, however indirectly, to that reality.

It must be stressed that, though the connection between conceptual levels is *real*, it is not a *correspondence* in the technical sense of the term. There is no one-to-one relation between the levels. Indeed, if this were so, it would imply that we are not, in fact, dealing with three levels but only one, though that one level takes three different forms for our conceptual convenience in different contexts. This mistake would seem to conceptually related to the modalist heresy in the early church.

At each of these levels, we attempt to develop disclosure models to engage with the same reality, though they differ from one another inasmuch as they are dealing with that reality at different levels and entail different degrees of abstraction and comprehensiveness.³⁷ It might be said that the disclosure model at each level is the product, though in a non-reductionistic way, of the one "below" it.³⁸ It is the complex question posed to reality at the evangelical-doxological or empirico-theoretical level that yields the insights we organize into a question or model of a higher order that functions as a theory or doctrine at the first distinctly theoretical/theological level. This level is always grounded in and kept in check by the one below it. It is through careful examination of what comes to light through these first two levels that we "freely

36 Examples of this kind of theory can easily be found in the thought of Heraclitus, Parmenides, Zeno, and many others.

37 While Morrison, *Knowledge of the Self-Revealing God*, 113, speaks of the results of our thinking at the second level, or first theoretical level, as being a disclosure model, he does not say that the empirico-theoretical level or the meta-scientific level are also disclosure models. The fact that *every* level of our engagement with reality is a disclosure model is important, for neither our basic empirico-theoretical data nor our unified theories are exempt from the need to be open to revision.

38 Cf. Bhaskar, *Realist Theory of Science*, 168-170.

create," to use Einstein's term,³⁹ a disclosure model at the third level that we hope will give us the tools we need to reach a more comprehensive grasp of our object. It must be noted that this third level is more abstract and thus is developed at the cost of a loss of concrete applicability; that is to say, there are fewer empirical correlates, and those that exist are less self-evident, for theories at the third level than for statements made at either of the lower levels.⁴⁰

Because these levels or models are always rooted in the levels below them (but can and must never be reduced to them), there are points of contact between them and yet the upper levels can change without necessarily changing the lower levels. This happens with some frequency such as in theology whenever there are shifts in doctrine but with no corresponding shift in canonical scripture or in natural science when there is a change in scientific theory with no change in the reality being investigated or, more precisely, no change in the "body of knowledge" from which those theories spring. An example of this is the change from a geocentric to a heliocentric model of the solar system without attempting to revise Tycho Brahe's data. What is still more significant is that the upper two levels can change independently of one another. Higher level theories or doctrines can change without a change in the lower level theories or doctrines. In the same way, *mutatis mutandis*, the lower level theories or doctrines can change without a change in reality or scripture.

Torrance expresses this in his own words.

At each of these stages the concepts we develop are integral to a whole cultural and rational system, so that advance can be made only with a radical shift in the basic fabric of thought together with a logical reconstruction of prior knowledge. This is not to claim that the basic concepts we reach in immediate intuitive experience of the world are changed, any more than our basic rationality alters, but that we reach a deeper and more appropriate understanding of our basic concepts and through them of the dynamic, multivariable world with which we are so

39 Albert Einstein, "Autobiographical Notes." In *Albert Einstein: Philosopher-Scientist*, edited by Schilpp, Paul Arthur, 1-94. (La Salle, Ill.: Open Court, 1970), 13.

40 *TS*, 236.

marvellously and intelligibly coordinated. This is why scientific inquiry advances only as it clarifies and deepens the foundations laid in the past. Otherwise it would be little more than a very sophisticated game without any empirical application to actual existence at all.⁴¹

Torrance mentions in a few places that lower level theories or doctrines can be changed without a change in the higher level ones. Indeed, one could say it is *on the basis* of higher level theories that we make such changes at lower levels. A concrete example of this is the doctrine of transubstantiation. It was put forward because, in the framework of thought that was dominant at the time, there seemed to be no other way to speak of the real presence of Christ in the Eucharist. Torrance believes that, now that we have more deeply understood the upper levels of theology, we realize that we must now kick such an understanding away, regardless of how helpful it might have been in the past.⁴²

Are there examples of this kind of development taking place?

More must be said regarding the issues raised by Torrance's use of multiple levels in theory construction but it is appropriate to pause for a moment and examine some examples of theoretical development in history. It matters very little if Torrance's understanding of theoretical development is conceptually consistent if it is not an appropriate account of reality. We shall consider first an example from Christian theology for which Torrance made his position explicit. Next, we shall direct our attention to a well-known example from the natural sciences and explore how Torrance's position might make sense of it.

41 *R&ST*, 148.

42 In Einstein's text, it is claimed that "As regards the final aim, intermediary layers are only of temporary nature. They must eventually disappear as irrelevant." "Physics and Reality," 64-65. Alister McGrath makes a similar, though perhaps more bold, claim that our theories can even transform our experiences at the basic level. *The Genesis of Doctrine: A Study in the Foundation of Doctrinal Criticism*. (Oxford: Blackwell, 1990), 66-72.

Later in his career, one of Torrance's main theological concerns was the Christian doctrine of the Trinity. He provides an account of the development of the doctrine as an organic response of the church to the sustained interaction of God with humanity as Father, Son, and Holy Spirit.⁴³ In this case, we might say that the transition from the first to the second levels was an attempt to answer the question, "Why is it that we seem to experience the one God as Father, Son, and Holy Spirit?" The attempt to bring this experience into some kind of theoretical coherence yielded the answer, "We have such ordered experiences because God actually interacts with us in a three-fold way."

As the church transitioned from the second to the third levels, it might be said that they were asking the question, "What is the reality that lies behind this three-fold encounter?" Orthodox Trinitarian theology has answered that question by saying that the reason that God interacts with us in a three-fold way is because God actually *is* Triune in being, that the terms "Father," "Son," and "Holy Spirit" are not just convenient ways to speak of how the *activity* of God is ordered, but are names for distinct, though inseparable, *Persons* in the Being of the one God.

It is important to note that this is not the only possible way to make the transition from the second to the third level. Modalism, for example, provides a different approach. According to Modalism, there is no fundamental *reality* to the distinctions between Father, Son, and Holy Spirit. They are merely "faces" or "masks" of the One God who elects to interact with us in a three-fold way. We shall return to the importance of both the similarities and differences of Orthodox Trinitarianism and Modalism below.

At this point in the discussion, it is important to note that the evangelical-doxological experience of the early Christians was not value-neutral but was already laden with theoretical issues that pressed for clear articulation and understanding. It is also important to note that organizing the experience at the first level into a theoretical account at the second level is not sufficient. Indeed, that theory becomes itself a compound question that must be answered.

43 For an account of the experience at the first level that the explicit doctrinal development was attempting to deal with, see the first three chapters of *CDG*.

In order to see how this move from the first level to the second level might take place within the natural sciences, let us consider what may seem to be the comparatively simple question as to how to explain our experience of the sun as rising in the East and setting in the West. The fact that the sun can be observed to do this is obvious to all. If one were to reflect, based only on their experience of the sun's motion across the sky, and not as someone who has already been educated to believe otherwise, it would seem natural to conclude that the sun goes around the earth. It is important to understand that this commonsense account has much to recommend it, *a priori*. The fact that modern Western people are currently dissatisfied with such a system must not be read, anachronistically, as implying that it was not empirically adequate or scientific, at least as regards the needs of science at the time. Though the conclusion that the sun travels around the earth is a reasonable explanation of our terrestrial experience, our experience does not *demand* such an explanation. History shows us that there exists a second explanation of the experience that is more acceptable to modern minds.

As was considered in chapter two, all knowledge is relative to a set of ultimate beliefs (in the broader sense). Some of these beliefs, which remained implicit at the first level, become more explicit with the transition to the second level. One of these convictions is that the earth does not seem to move. Indeed, there were arguments to this effect. If the earth makes a complete rotation every day, it was argued that a tower from which a rock is dropped "would travel many yards to the east in the time the rock would consume in its fall, and the rock ought to strike the earth that distance away from the base of the tower."⁴⁴ If one were to rely purely on the direct experience of countless individuals and some commonsense theoretical convictions, a geocentric view of the universe is not only *possible* but *plausible*. Many of the greatest scientific advances were opposed by people who were not ignorant but deeply reflective and rational.⁴⁵ For

44 Galileo Galilei, *Dialogue Concerning the Two Chief World Systems*, (Berkeley, 1953), 126, quoted in Feyerabend, *Against Method*. 3rd ed. (London: Verso, 1993), 56.

45 See Paul K. Feyerabend, *Science in a Free Society*. (London: London NLB, 1978), 40-53, for an interesting defense of those who affirmed the Ptolemaic cosmology against Copernicus and Galileo. Additionally, see Torrance's point that Clerk Maxwell's field theory was opposed by Lord Kelvin who called it "mysticism." See *PCT*, 22; *CFM*, 110-111, 152.

our purposes, this example will help us to see how theories change and how to make sense of that change.

We find that Torrance's account of theoretical development also makes sense of the transition from the second to the third level in this case. At this stage, a concept which seems promising for unifying and conceptually simplifying the totality of scientific knowledge is chosen and the experiences to be explained are reexamined. The question is raised, "If the earth is stationary while the sun revolves around it, how are we to understand the motion of the heavenly bodies?" Within the geocentric theory, the location of the earth in the center of the universe is not just a theoretical account of why the sun goes up in the East and sets in the West. Rather, it functions as a fundamental axiom of astronomy. All explanation of celestial phenomena was to be made against the background of the belief in a fixed earth around which the heavens rotated.

It must be noted that, as far as theories go, the geocentric theory of the solar system was not unsuccessful. It was a coherent system that was able to predict the astrological phenomena that most people cared about at the time as well as any other system thus far.⁴⁶ It was consistent, accurate, and abundantly empirical. After all, we do not observe planets orbiting around the sun. We have no access to the kind of outside perspective that would be required for such an experience. The only place, until recently, we had to make astronomical observations was from the surface of the earth. It is not hard to see that the notion that circular orbits were to be preferred over orbits full of epicycles could be seen as nothing more than a preference of an abstract concept over the evidence of one's own eyes.⁴⁷

46 Thomas S. Kuhn, *The Structure of Scientific Revolutions*. 3rd ed. (Chicago: University of Chicago Press, 1996), 68. The adjustments made to the system over time were no more radical than the way "primitive" cultures can explain away experiences which clash with their worldview. See Michael Polanyi, *Personal Knowledge: Towards a Post-Critical Philosophy*. (Chicago: University of Chicago Press, 1958), 286-289.

47 Feyerabend quotes Galileo as interpreting his position in precisely this way. "Nor can I ever sufficiently admire the outstanding acumen of those who have taken hold of this opinion [Copernicanism] and accepted it as true: they have, through sheer force of intellect, done such violence to their own senses as to prefer what reason told them over that which sensible experience plainly showed them to the contrary." Copernicus, *Dialogue Concerning the Two Chief World Systems*, (Berkeley, 1953), 328, cited in Feyerabend, *Against Method*, 82. Also Michael Polanyi,

Though geocentric theories of the solar system such as those opposed by Galileo have been all but entirely discredited in contemporary science and culture, Torrance's account of how theories get developed and become rooted as ontological as well as epistemological commitments makes sense of why a rival theoretical system might not be welcomed with open arms. The rejection by the scientific community of geocentrism for heliocentrism suggests that we do not only need a new theory at the second level which makes better sense of the evidence but also a new way of understanding such theories at the third level. Conflicts between interpretations are seldom resolved by asking the question, "Which theory provides a better account of the evidence," as Duhem and Quine have shown,⁴⁸ and are often battles that represent conflicting ontological commitments as well as conflicting epistemological commitments.

What choices does one have regarding the third level?

It is entirely plausible that a person may, upon reflecting on Torrance's account of the stratification of our theories, desire simply to avoid the third level altogether. A reaction of this kind is probable if one has sympathies with the empiricist tradition and views any claim that explicitly goes beyond experience with suspicion. If we may force people who, as far as can be discerned, had no awareness of Torrance's thought into his framework Bas C. Van Fraassen, with his position called "Constructive Empiricism," seems to be just such a person.⁴⁹

Described briefly, Constructive Empiricism is a non-positivist development of the empiricist tradition. There is no attempt to claim that merely reporting experiences is sufficient for scientific practice. However, nothing more is to be claimed for our

Personal Knowledge, 3-4.

48 Pierre Duhem, "Physical Theory and Experiment." In *Can Theories be Refuted: Essays on the Duhem-Quine Thesis*, edited by Harding, Sandra G., 1-40. (Boston: D. Reidel Publishing Company, 1976), and W. V. O. Quine, "Two Dogmas of Empiricism." In *From a Logical Point of View*. Revised ed., 20-46. (New York: Harper Torchbook, 1953).

49 For Van Fraassen's exposition of Constructive Empiricism, see *The Scientific Image*. (Oxford: Oxford University Press, 1980).

theories than empirical adequacy. Our theories ought to be interpreted literally,⁵⁰ but we should not ask if they are *true*, only if they are *empirically adequate*.

From one point of view, it might not seem that Van Fraassen would have a difficulty with developing the kind of higher level theories that Torrance describes at the third level of our theoretical development. Indeed, it would seem that such a theory could be interpreted as nothing more than an account of experiences as comprehensive and simple as possible and need not be any more "true," rather than merely empirically adequate, than theories at a lower level. Van Fraassen believes that the most important role that theory plays within scientific practice is that it informs experimental design.⁵¹ It could be claimed that a third level theory is no less appropriate for planning experiments than a second level theory.

Whether this is an acceptable position to others or not, it certainly would not be acceptable to Torrance on his own interpretation of the third level of our theories. For Torrance, we are concerned with ontological claims at the third level, with tapping into the inner logic of reality and giving expression to its inherent intelligibility. For Torrance, one cannot have a third level theory without making ontological claims of one kind or another.

Indeed, it would seem that Torrance does not believe that it is possible to refrain from making the transition from the second to the third level of our theoretical development. Rather, it would seem that it is at this point where our ultimate or penultimate beliefs come to the surface and condition everything else we believe. For Torrance, we cannot avoid the fact that there are certain things we believe about reality. This becomes a significant problem when one is unaware of these beliefs. When one is unaware of the convictions that shape their thinking, they are not being epistemically neutral but are having their epistemological values shaped without their critical engagement and, thus, they are being accepted uncritically.⁵²

50 Van Fraassen, *The Scientific Image*, 10.

51 Van Fraassen, *The Scientific Image*, 73.

52 *CT&SC*, 13. Bhaskar makes a similar statement about a particular instance of this phenomenon.

"Humean empiricism is not neutral in its consequences for scientific practice. Taken consistently, it does generate a methodology; not indeed Hume's (or Newton's), but Mach's." *Realist Theory of Science*, 42.

Torrance's conviction that, whatever may be the case at the second level of our theoretical development, it is not possible to make third level theories without ontological commitment means that, for Torrance, if we are confronted with more than one theory which is empirically equivalent, we are not able to withhold judgment.

Torrance does not always fit in with the mainstream of what goes by the name of "scientific realism," but he is undoubtedly a realist when it comes to the so-called problems of empirical equivalence and of underdetermination of theory by evidence. In Richard Feynman's *The Character of Physical Law*,⁵³ to cite an accessible example,⁵⁴ we are presented with three ways to describe the effects of what we call gravity that are empirically equivalent but psychologically and philosophically quite different, which he calls "Newton's law, the local field method and the minimum principle."⁵⁵ Feynman concludes that they are scientifically equivalent, that there is no clear choice as to which of them is the "right" way to calculate the motion of, say, a planet. This may be so, but only if we limit ourselves to the case where we are concerned merely with empirical adequacy rather than truth. To claim that these procedures are equivalent is to limit our consideration to only the first and second levels of our theoretical development. If we were to ask the question as to what it is that gives rise to this experience, which is surely unavoidable in the advance of science, we cannot stop there but must move to the third level.

As long as we are of the opinion that science is merely an analysis of phenomena, we need go no further than Feynman's account. However, though these models are equivalent at the first level of empirico-theoretical engagement with reality, even this first theoretical level has produced wildly different accounts. There is a way of choosing between them, but doing so commits us to precisely the kind of ontological perspective that people like Feynman are hoping to avoid. It is worth emphasizing again that attempting to refrain from assuming an ontological position is itself an ontological position, namely that phenomena are all there is.⁵⁶ Torrance's model for theory choice

53 Richard Feynman, *The Character of Physical Law*. (London: Cox and Wyman, Ltd., 1965), 44-47.

54 Those wishing to explore the issue of empirical equivalence in more depth might see André Kukla, *Studies in Scientific Realism*. (Oxford: Oxford University Press, 1998), 58-91.

55 Feynman, *Character of Physical Law*, 47.

56 It would seem that Torrance would be in agreement with Bhaskar's statement, "But if transcendental

based on ontological convictions at the third level is an entirely realist, as opposed to anti-realist, position. However, because of the in-built flexibility of disclosure models, he is able to avoid the pitfalls of other realist accounts that collapse the moment the historical development of theories is discussed.

What is the problem of underdetermination?

In this analysis of how we make a decision regarding third level theories we are concerned with the problem in the philosophy of science known as the underdetermination of theory by evidence. André Kukla suggests that

The main argument for antirealism is undoubtedly the argument from the underdetermination of theory by all possible data. Here is one way to represent it: (1) all theories have indefinitely many empirically equivalent rivals; (2) empirically equivalent hypotheses are equally believable; (3) therefore, belief in any theory must be arbitrary and unfounded.⁵⁷

It should be noted that realists have argued that underdetermination is not as great a challenge to realism as anti-realists have suggested. Albert Einstein suggested that, in actual scientific practice, the problem of underdetermination simply never arises.

The supreme task of the physicist is to arrive at those universal elementary laws from which the cosmos can be built up by pure deduction. There is no logical path to these laws; only intuition, resting on sympathetic understanding of experience, can reach them. In this methodological uncertainty, one might suppose that there were any number of possible systems of theoretical physics all with an equal

realism is correct, and ontology cannot in fact be reduced to epistemology, then denying the possibility of an ontology merely results in the generation of an *implicit ontology* and an *implicit realism*." *Realist Theory of Science*, 40.

57 Kukla, *Studies in Scientific Realism*, 58.

amount to be said for them; and this opinion is no doubt correct, theoretically. But evolution has shown that at any given moment out of all conceivable constructions one has always proved itself absolutely superior to all the rest. Nobody who has really gone deeply into the matter will deny that in practice the world of phenomena unambiguously determines the theoretical system, in spite of the fact that there is no logical bridge between phenomena and their theoretical principles; this is what Leibniz described so happily as a “pre-established harmony.” Physicists often accuse epistemologists of not paying sufficient attention to this fact. Here, it seems to me, lie the roots of the controversy carried on some years ago between Mach and Planck.⁵⁸

It is important to note that this claim was made fairly early in Einstein's career⁵⁹ and that it would not be long before quantum phenomena developed rival schools of interpretation, at least one of which was distasteful to him.⁶⁰ However, it is relevant that Einstein believes that science will organically and pragmatically solve the problem of underdetermination if left to its own devices.

Another approach is that represented by theologian Alister McGrath, who suggests that, when faced with two empirically equivalent rival theories, we ought to refrain from making a judgment until further evidence comes to light.⁶¹ This has been the wisdom that has informed the tradition of devising and conducting so-called “crucial experiments” to decide between theories which are, at a given point in time, empirically equivalent.

However, it is not the case that theories which are empirically equivalent are always so *accidentally*, that is, due to evidence available at a particular point in time. It is not only possible that theories can have rivals which are *necessarily* empirically

58 Albert Einstein, “Principles of Scientific Research.” In *The World as I See it*, 123-127. (New York: Covici Publishing Company, 1934), 125-126.

59 The statement was made in an address in honor of Planck's sixtieth birthday, which was in 1918.

60 The Copenhagen school, which has become dominant over its rivals such as the Bohmian interpretation, was famously resisted by Einstein throughout his life.

61 Alister E. McGrath, *A Scientific Theology, Vol. 2 - Reality*. (Edinburgh: T & T Clark, 2002), 169.

equivalent but that *all* theories have such rivals.⁶² If this is so, then the problem of underdetermination is a real one and a solution of some kind must be found.

To give an example that is particularly relevant against the background of Torrance's theology, it can be said that Modalism and Orthodox Trinitarianism are third level theories which are empirically equivalent at the first and second levels.⁶³ Both operate with the same set of experiences, recorded in the Biblical witness. Both organize those experiences into essentially equivalent accounts at the second level, for both will grant that God's interaction with humanity is as Father, Son, and Holy Spirit. Their differences arise in the transition to the third level, where Trinitarianism claims that this *economic* triunity is rooted in an *ontological* triunity in God's own life whereas Modalism claims that, in God's own being, God is one and without inherent distinctions.

There is no Biblical statement that can serve as an unambiguous means to force a decision for one alternative against the others. Any ontological claim made by a Trinitarian can be accounted for by the Modalist by saying, "God behaves toward us *as if* that were the case, but this does not mean that God actually *is* this way." This "as if" clause has its parallel in the philosophy of science. Anti-realist interpretations of

62 One example of such empirically equivalent rivals in natural science is the way to explain the force of gravity mentioned in Feynman, *The Character of Physical Law*, 44-47. Each method is philosophically different and, if interpreted realistically, are entirely different theories. However, they are empirically equivalent and there is no example in which the different interpretations of gravity will produce different empirical predictions.

It should be noted, however, that this use of "empirically equivalent rival" is not uncontested. What will here be called a necessarily empirically equivalent rival could, from another perspective, be called a different interpretation of the same theory. While the latter interpretation has much to recommend it, the theological example in what follows, of orthodox Trinitarianism and Modalism, inclines this theologian to treat such "interpretations" as different theories, as they have been treated as such in the history of the church.

63 If it is argued that modalism in the form articulated in this section has no historical advocates, it is of no concern. If that is so, it need merely be said that Modalism and Orthodox Trinitarianism *can be made* empirically equivalent to one another.

theories claim effectively the same thing. "Reality behaves *as if* the theory were literally true, but that does not mean that it is actually so."⁶⁴

It need hardly be mentioned that a Trinitarian will not find the Modalist response satisfactory any more than the scientific realist will find the anti-realist response satisfactory. However, psychological satisfaction or dissatisfaction is not strictly relevant to the standard problem of underdetermination, which arises due to the empiricist conviction cited above that "empirically equivalent hypotheses are equally believable." It is interesting to note that both sides of such a disagreement can appeal to Ockham's Razor in support of their view. The modalist or scientific anti-realist can claim that their account is simpler because it requires the existence of fewer entities and, as such, it is a metaphysically simpler account. The Trinitarian or scientific realist, by contrast, can claim that their position requires fewer epistemological leaps and, as such, it is an epistemologically simpler account.⁶⁵

It would seem that Torrance would approach such a situation by saying that the two positions are informed by mutually exclusive penultimate beliefs. Whether either view is required by reality is not certain but *it is* certain that it is not possible that they *both* are.

There would seem to be, for Torrance, a real problem with contenting ourselves with mere empirical adequacy for our theories; namely, that it does not take account of the influence over our thinking and believing exercised by our ultimate and penultimate beliefs. This conviction, that empirical adequacy is *not* the only epistemological virtue and thus that underdeterminacy is not truly a "problem," makes it clear that, whatever resonances there are between Torrance's thought and particular anti-realist thinkers, Torrance is telling the truth when he claims to be a realist.

If a decision cannot be made between two theories based on empirical considerations alone, is there anything else that can inform our theory choice? As has

64 It must be noted that, while those such as Van Fraassen, see Kukla, *Studies in Scientific Realism*, 59, consider a realist and an anti-realist interpretation of a theory to be empirically equivalent rivals, others such as Laudan and Leplin have rejected this. "Empirical Equivalence and Underdetermination." *The Journal of Philosophy* 88, no. 9 (Sep. 1991), 455-456.

65 Other philosophical traditions might call this epistemological simplicity "superior explanatory power."

already been hinted at above our ultimate and penultimate beliefs, or what some might call psychological considerations, can play a major role.

With regard to our example, it is easy to make a decision between Modalism and Trinitarianism if one appeals to the behavior of a body of people.⁶⁶ If a body of people conducts itself in such a way that it relies upon a particular interpretation at the third level, then it will find the fact that another view can be constructed as empirically equivalent untroubling. In this case, the fact that the Christian Church has historically proclaimed that the core of the gospel is that, in Christ, God has actually revealed God's self to us within our world of space and time in a true and faithful way, the Modalist position is simply untenable. While a Modalist may believe that Trinitarianism makes too many metaphysical claims, a Trinitarian will be left with the persistent concern that Modalism can be of no use to humanity since it maintains that, even in Christ, God does not reveal God's self to us as God is in God's own life.

In light of these considerations it would seem that, for all his deep concern that we express ourselves as accurately as possible, Torrance is more concerned with behavior than with mere intellectual analysis.⁶⁷ If someone has sympathies with epistemological simplicity and would otherwise be inclined to affirm Modalism but they live their lives as if, in Jesus Christ, God has faithfully revealed God's self to humanity, it would seem that, while Torrance might desire that they change how they express themselves they are, in fact, Trinitarian even if they do not describe themselves as such.⁶⁸

66 "The theories we develop are never complete, so that even if two of them are empirically equivalent, they will be accompanied by research programmes which are generally very different." Van Fraassen, *The Scientific Image*, 202.

67 This is evident in Torrance's insistence that John Philoponus was not a monophysite, in spite of some linguistic tendencies that might imply such a position. *G&G*, 61.

68 It would seem that, though Torrance never expresses this conviction so explicitly, he would be in significant agreement with John Wesley, who claimed that every Christian is inherent Trinitarian. "Not that every Christian believer *advert*s to this; perhaps at first, not one in twenty; But if you ask any of them a few questions, you will easily find it is implied in what he believes." John Wesley, "Sermon 55: On the Trinity." In *The Works of John Wesley*, edited by Outler, Albert C. Vol. 2, 373-386. (Nashville: Abingdon Press, 1985), §18, 385.

This rather lengthy analysis of the transition from the second to the third level in our theoretical development has sought to articulate the elements of realism in Torrance's thought. For Torrance, there is no way to avoid making ontological commitments. However, it seems that this affirmation traps Torrance back into the troubles raised by anti-realist critiques of scientific realism. How can one have any confidence in one's ontological commitments expressed in their theories when theories change over time?

The reason that Torrance's belief that higher level theories carry ontological commitments does not trap him in such an unpleasant position is that, for Torrance, *all* our theories, no matter high their level, are ultimately disclosure models. We are never able to conclude that we have captured the truth of being in our statements, for reality never fails to outstrip and relativize our statements about it.

What does Torrance mean by describing a theory as a "Limiting Case?"

In chapter four it was argued that Torrance's position does not require that replaced theories be labeled purely as "false." It was claimed that replaced theories can still be considered "truthful" to the degree that they are "rooted in reality." In this case, the fact that a theory is replaced is not to be understood primarily as a failure of that theory but rather as its success. The replaced theory has served its function, directing us outside of itself to the reality that lies beyond it. It is precisely because the theory was rooted in reality that this reference was possible and it was on the basis of what was learned from additional experience with reality that the theory was deemed inadequate and needed to be replaced.

Torrance will occasionally refer to replaced theories as continuing to be useful as "limiting cases" of subsequent theories.⁶⁹ In particular, he highlights Newtonian physics as a theory of this kind. It is possible for Newtonian physics to function as a

⁶⁹ For Torrance's use of the phrase "limiting case," see *D&CO*, 27-28; *T&C*, 45, 180, 321-322; *G&G*, 103, 171-172; *CDG*, 85-86; *ST&R*, 16-17. Torrance claims the term comes from Von Weizsäcker in *TS*, 265-266.

first approximation of Einsteinian physics which is entirely appropriate and empirically adequate in circumstances where the difference in the results generated by Newtonian and Relativity physics is negligible for the task at hand.⁷⁰

This means that, though Newtonian thought must now be relativized by subsequent developments and its ability to continue to be useful is not something it has in itself but is the result of interpreting Newton in an Einsteinian framework of thought, it is important that we do not merely condemn Newtonian thought as "false."⁷¹ Newton achieved something very important and that achievement will never be wholly lost, though it has had to be reinterpreted. The world can never turn its back on Newton or his system. We have only been able to move *beyond* Newton by making extensive *use* of Newton. Some of Newton's scientific insights shall remain, though it is only possible to see *which* insights will remain *a posteriori*. We saw that this is also the case in theological development with the example of the doctrine of transubstantiation, discussed above.

This helps to explain why Tapio Luoma believes there to be some confusion about the status of the Nicene *homoousion* in Torrance's theology, as to whether it is a disclosure model or something else.⁷²

In the ultimate analysis, Torrance is reluctant to suggest what kind of reevaluation there possibly could be with regard to the *homoousion*. Therefore one can claim that although the *homoousion* meets the requirements of a disclosure model as set by Torrance, they cannot ultimately be identified because of the normative character and status the patristic term has gained over the centuries. In other words, the *homoousion* is in essence more than a disclosure model - it is "a fundamental dogma, which once it comes to view becomes normative

70 The use of the term "approximation" should not be interpreted as implying that Newtonian physics is useful because it is "approximately true." Rather, its continued usefulness is based on pragmatic, rather than theoretical, considerations.

71 This is important to note because, under a strict correspondence theory of truth, this is precisely what we would have to do.

72 Tapio Luoma, *Incarnation and Physics: Natural Science in the Theology of Thomas F. Torrance*. (Oxford: Oxford University Press, 2003), 39.

for all faithful theological statement, for it enables it to be made in true correspondence with its proper object and in consistent relations with other faithful statements.” Thus the *homoousion* is certainly an absolute concept which cannot, in practice, be altered or replaced or even given any deeper reevaluation without severely damaging the current self-understanding of the Christian Church. This leads us to make the claim that in this respect Torrance's thought remains imprecise because, as was shown, on the one hand he considers it as a revisable concept but on the other he allows it as a normative authority.⁷³

Luoma suggests that the *homoousion* would be more accurately described as an "authoritative and normative methodological tool" for Torrance.⁷⁴

In order to understand the role of the *homoousion* in Torrance's thought and how it relates to Torrance's concept of disclosure models, let us consider a metaphor utilized several times in his later academic career.

In the Nicene formulation of the *homoousion* something absolutely fundamental took place in the mind of the early Church. It was a decisive step in deeper understanding of the Gospel, taken in the continuity of the apostolic tradition, upon which the Church, in obedience to God's saving revelation in Jesus Christ, could not go back. It was an irreversible event in the history of Christian theology. The significance of what happened may be indicated by reference to what we do with a jig-saw puzzle. We assemble the scattered pieces together, fitting them appropriately to each other until the pattern they conjointly make comes to view. If we then break it all up and throw the pieces back into disorder, we may have little difficulty in fitting them all together again, but it will be impossible for us to do that without recalling the picture we reached the first time.

Something irreversible would have taken place in our mind and memory,

⁷³ Luoma, *Incarnation and Physics*, 41.

⁷⁴ Luoma, *Incarnation and Physics*, 41.

which could not but influence all subsequent attempts to recover the coherent pattern made by the different pieces.⁷⁵

Torrance believes that something irreversible took place at Nicaea, something which can never be undone or forgotten entirely. Though Torrance admits the possibility that there may come a time when even something as central as the *homoousion* may need to be revised, this is not to say that it will ever be entirely condemned as "false." Key insights of the *homoousion* will be retained in the future for it is economically rooted in reality. However, as the church has not yet gone through that paradigm shift, it is impossible to predict precisely which elements of the *homoousion* will be taken up into a subsequent theory. It is because of this that Torrance is not being inconsistent when he claims both that the *homoousion* is neither sacrosanct nor irreformable and also that it remains the fundamental theological conviction for Christian faith.⁷⁶ The *homoousion* represents a disclosure model that has manifested itself as being deeply rooted in reality but, as the insight it represents will never be lost, even if we should find that we must go beyond it, it need not be vested with a quasi-supernatural status.

Has anyone else undertaken research advocating the stratification of our theories?

We return now to our dialogue with Roy Bhaskar because we find that another fascinating parallel between these two men is in the significance they place on the fact that the world, and our knowledge of it, is stratified. Bhaskar distinguishes between three "domains:" the domain of the *empirical*, the domain of the *actual* and the domain of the *real*, each of which is contained by the ones after it.⁷⁷ To summarize, the experiences that we have are not arbitrary but arise from actual events outside of ourselves. These are *also* not self-generating but arise because of the mechanisms or tendencies that exist at a deeper level. These mechanisms or tendencies are neither

⁷⁵ *TF*, 144. Cf. *MC*, 4; "TR," 185; *CDG*, x; *ST&R*, 168.

⁷⁶ Luoma, *Incarnation and Physics* 40; Thomas F. Torrance (ed.), *The Incarnation: Ecumenical Studies in the Nicene-Constantinopolitan Creed A.D. 381*. (Edinburgh: Handsel Press, 1981), xiii. See also *DM*, 253.

⁷⁷ Bhaskar, *Realist Theory of Science*, 229.

empirical nor *actual*, as they are not "experienced" and they do not "happen," but they condition everything that happens or is experienced.

Not every experience necessarily yields a clear picture into the domain of the real, as distinct from the other two levels. However, once we gain an insight into the real structures of the world, we interpret our experiences in light of them. What appear to be contrary experiences can then be interpreted as arising due to the fact that we do not always operate within experimentally closed circumstances. Once we have come to the conviction that there is a *real* mechanism underlying our experience, we become far more likely to judge our experience in light of the mechanism rather than the mechanism in the light of our experience. Thus, Bhaskar is arguing for a *realist* theory of science rather than an empiricist one. Once we allow theory to explicitly influence our engagement and even call our experience into question, we have moved beyond empiricism into a form of realism.

Torrance's stratification of our theories has strong resonances with Bhaskar's stratification of "domains." It is important to note that the use of the word "resonance" here is deliberate. Torrance consistently uses terms that skew toward what could be called the subjective-pole of realism while Bhaskar tends to speak in a way that favors the objective-pole. This means that, in spite of the fact that Bhaskar is not seeking to defend what Polanyi has called "objectivism," he tends to lean further in that direction that Torrance.

For example, in the preface to his *Realist Theory of Science*,⁷⁸ Bhaskar describes two strands of thought in the philosophy of science, the key insights of which he hoped to weave together. The former "emphasizes the *social* character of science and focuses particularly on the phenomena of scientific change and development" and is accompanied by a list of names, several of which, such as Kuhn, Popper, and Polanyi, are mentioned by Torrance in one way or another. The other "stresses the difference between explanation and prediction and emphasizes the role played by models in scientific thought" and is accompanied by a list of names that do not play any role at all in Torrance's writing. The fact that, for Bhaskar, Torrance would likely appear to fit into

⁷⁸ Bhaskar, *Realist Theory of Science*, 9.

this first group might explain the difference in their ways of speaking of this stratification.

Bhaskar's domains of the empirical, actual, and real precisely parallel Torrance's evangelical-doxological (or empirico-theoretical), First Theological (or Theoretical), and Second Theological (or Theoretical) levels. It is necessary to grasp this parallel in order to understand a pithy slogan in the concluding pages of Bhaskar's book, "Epistemological relativism, in this sense, is the handmaiden of ontological realism and must be accepted."⁷⁹ If we are realists, in Bhaskar's sense, we must not become so devoted to a particular expression of reality that we begin to collapse the domain of the real into nothing more than the domain of the empirical. That is, we must not commit what Bhaskar calls the "epistemic fallacy," which says that all statements about being can be translated without remainder into statements about our *knowledge* of being.⁸⁰ The parallel issue in Torrance's thought is given concise expression by David Munchin. "Torrance is consistent, in that he admits this [Pannenberg's charge of] 'relativity' at the epistemic level, but denies the possibility of the philosophic-ontological relativism inherent in much post modern thought, which seeks to drive epistemic relativity down to the ontic level."⁸¹

The question must be raised as to what this epistemological relativism looks like for Bhaskar. It would seem that this kind of relativism cannot characterize the domain of the real for it is precisely on the basis of that domain that Bhaskar claims requires epistemological relativism. It seems equally difficult to have such relativism in the domain of the empirical. After all, Bhaskar denies that theories are merely convenient arrangements of empirical data;⁸² indeed, theory is necessary to help us understand which experiences are epistemically significant. The only other option would seem to be that epistemological relativism takes place in the domain of the actual. If, when he

79 Bhaskar, *Realist Theory of Science*, 249.

80 Bhaskar, *Realist Theory of Science*, 16.

81 Munchin, *Is Theology a Science?* 239.

82 The fact that Bhaskar denies the adequacy of the classical positivist understanding of theory is manifest in his approving remarks that Transcendental Idealists realize the need for a "surplus element" to make their experiences hold together. The fact that they realize this is to their credit, though Bhaskar thinks they need to push things further. *Realist Theory of Science*, 148-163.

speaks of the domain of the actual, we may interpret Bhaskar as always speaking of our *a posteriori* theoretical reconstruction of the domain of the actual, then it is possible to understand how ontological realism and epistemological relativism can go hand-in-hand and indeed, how the former can demand the latter. However, Bhaskar does not make this clear.

Torrance, on the other hand, with his more explicitly theoretical language, seems to be able to make it clearer how ontological realism, or convictions at the second theoretical level, demands epistemological relativism, or relativism concerning convictions at the first theoretical level. A clear example of this is the medieval development of the doctrine of Transubstantiation.⁸³ The church had an unshakable conviction that, at the celebration of the Eucharist, Christ is present with his people. At the time, when Aristotelian metaphysics dominated academic thought, there was no way to speak of this presence except in terms of substance and accidents, and so Transubstantiation, at that time, was not only a faithful response of that realist conviction, it was the *only* faithful response to it.

As a Reformed theologian, it hardly needs to be mentioned that Torrance does not affirm Transubstantiation. However, the critique of Transubstantiation arises from the very same level (the third level) that gave rise to it in the first place. The same conviction regarding the presence of Christ at the Eucharist called into question the Aristotelian categories that had so profoundly shaped the discussion. It was only because Aristotle had been significantly criticized by the Reformers that a new way of thinking about the presence of Christ at the Eucharist, the doctrine of the Real Presence, was possible.

In the advance of human thought we develop theoretic constructs and connections which may well be necessary within certain limits, but which are later found to be no more than intermediate devices, ladders by which we climb from one level to another but which can be, and must be, kicked away when they have done their job.⁸⁴

83 *T&C*, 326-327.

84 *R&ST*, 155. See also *T&C*, 67 for an application to the natural sciences.

What are the implications of Disclosure Models for Torrance's philosophy of science?

Torrance's disclosure models are a self-consciously realist tool for scientific investigation. They presuppose a reality to which the disclosure model gives us access. The question that must be asked is whether Torrance's position provides a satisfactory account of the problems in the philosophy of science, particularly those surrounding scientific realism. In order to answer that question and evaluate whether Torrance's position is satisfactory, we shall examine how it handles the problems traditionally faced by both scientific anti-realism as well as scientific realism.

It was argued above that the single greatest problem faced by scientific anti-realism, at least from the point of view of a realist, is that it makes our theories functionally separate from reality. Torrance's disclosure models avoid this difficulty because, though it is important to seek disclosure models which are empirically adequate at the time they are affirmed, the fact that the disclosure model distinguishes itself from reality and is to be understood as relativized by that reality in the course of investigation makes it clear that disclosure models are not concerned merely with providing a convenient arrangement of our experiences but with actually making contact with reality and thereby demonstrating that they are rooted in reality (or, one may prefer to say, truthful).

The historical development of theories, within a given field, which are incommensurate with one another can be seen as a problem for scientific realism. It would seem that if we affirm realism for our *current* theories it means that we condemn a realistic interpretation of *previous* theories. Additionally, if the time comes that a new theory should arise, incommensurate with one we hold now, would not the suggestion that theories, at least our best ones at any given time, should be interpreted realistically imply that this *new* theory is to be seen as real, thus condemning such an attitude toward our current theory?⁸⁵ Articulated in this way, it would seem that the phenomenon of incommensurability makes some forms of scientific realism self-defeating.

85 This is a form of Putnam's Pessimistic Meta-Induction.

Torrance's theory of disclosure models reveals this concern to be a false one. Disclosure models imply that the reality they direct us to is far deeper and richer than we could ever predict. This means that new information will come to light through our use of such models that reveals that reality is not exactly what we expected it to be. Unless we have always, since the very beginning of scientific investigation, been on a direct trajectory toward a perfect understanding of reality with no false starts or overcorrections, we would expect that such a reality will not only reveal that our theories are inadequate in the sense that they are not "fine grained" enough but that they have missed some piece of information that transforms everything we knew before. Thus the presuppositions that are implicit in disclosure models lead us to expect that such incommensurate theories will arise. Indeed, on such presuppositions, it would be far more surprising if they did *not* arise.

Closely related to the problem raised by incommensurability is that of meaning variance. As theories develop, terms take on new meaning, such as was the case with "atom" as discussed already.⁸⁶ How can we take realism seriously if it keeps changing what it means by the terms being used? Does not the fact that terms can change meaning so often mean that scientific realism is unreasonable?

Such an objection is compelling only if Torrance's realism were primarily about our theories as such and not about that which lies *behind* and *beyond* those theories. Again, it is precisely *because* our terms keep changing that Torrance's realism seems justified. Terms do not change, like "atom," because our theories have failed to make meaningful contact with reality. Rather, they change precisely because they have succeeded in facilitating that contact. We approach reality with a "primitive" atomic theory and we realize that there are subatomic particles. We construct a model that makes sense to us and approach reality again, say with Thomson's "plum pudding" model. We find that this works better but produces phenomena that we would not expect, such as the pattern of scattering of alpha particles when fired at a thin layer of

86 Chapter 4.

gold foil, as revealed by the Geiger-Marsden experiment.⁸⁷ It is precisely because we are unable to collapse reality into our statements *about* reality that our terms change.

This means that Torrance's position provides a solution to the problem of reference. When we say "atom," we could be using it in any of the senses the term bears but precisely which sense is being used at any given time will be determined by the context. In some fields, the internal structure of the atom is only nominally useful and so it is understood at a comparatively "low" level of detail. In others, such internal structure will be precisely what is under investigation and thus be extremely important. Torrance's notion of a "limiting case" discussed above implies that we need not use terms univocally; they can, and do, bear many levels of interpretation. If reality is stratified as it was described to be in chapter one, we ought to expect this stratification of meanings for our terms.

As was discussed at some length above, Torrance's view navigates the problem of underdetermination by self-consciously acknowledging that we find certain non-empirical considerations to have epistemic value. Additionally, it should be noted that, once again, the relative poverty of our theories when compared to reality shows that, though the underdetermination of theory by evidence is a real phenomenon, it is not a *problem* for Torrance's realism. If our theories are always directing us to a reality which transcends them, we should expect there to be, at any point in time, empirically equivalent rivals for our theories. If such were not the case, it would seem to imply that real progress could never take place. If Einstein's theory could be anachronistically imported into the early eighteenth century, it could be claimed that the choice between it and Newtonian physics is underdetermined by evidence. Unless we think we have already reached a final or ultimate theory, which disclosure models do not, by their very nature, assume, we should expect that there is an as-yet-unheard of theory that, if we had access to it, would be empirically equivalent with regard to the evidence we have at a given moment in time to our current theory, yet is more deeply rooted in reality.

87 H. Geiger, "On the Scattering of the α -Particles by Matter." *Proceedings of the Royal Society of London* (August 1908), 174-177.

Does Torrance's realism *demand* the traditional "problems" of scientific realism?

What is particularly fascinating about Torrance's realism is that it not only avoids the traditional problems faced by scientific realism but it seems to do so in a more satisfactory way than anti-realism seems capable of. It is true that scientific anti-realism is not damaged by the critiques it makes of scientific realism but there would not seem to be any reason, on the anti-realist perspective, to *expect, a priori*, that those critiques should have an actual historical and empirical basis. That is to say, the strongest arguments in favor of anti-realism are built upon phenomena that it uses but could never have produced or predicted on its own.

By contrast, Torrance's realism does not only avoid the damaging effects of anti-realist critiques of scientific realism, it actually *demand*s the phenomena upon which those critiques are based. Torrance's realism *implies* that, over time, there will be changes in our theories, that those changes will likely result in significant incommensurability between theories, that our terms will change their meaning over time, and that any evidence we have at any point time will not uniquely determine a particular theoretical account of that evidence. It does all this from a self-consciously *realist* perspective.

To whatever degree the ability to make predictions is valuable to a perspective in the philosophy of science, Torrance's position would seem to be more valuable than a strict anti-realist one. While it is not possible to predict what future theories will look like, Torrance's realism predicts, based on its own convictions, that there *will* and *must be* new theories while anti-realism's prediction of new theories is more accurately described as a "suspicion" that there will be such new theories.

To whatever degree the ability to explain why things are the way they are and not some other way is valuable to a perspective in the philosophy of science, Torrance's position would seem to be more valuable than a strict anti-realist one. While Torrance's realism makes it clear that theories change due to the fact that reality far exceeds the ability of our theories to describe or explain them, anti-realism has difficulties explaining why our theories ought to change over time. To do so, it would seem that there would need to be some theory-independent reality that can challenge our theoretical constructions. However, if it is affirmed that such a reality exists and that we

have access to it, it would seem to imply something not altogether unlike Torrance's realism.

Torrance's realism thus seems to provide a robust and consistent interpretation of the relation between our theories and reality. While it would be irresponsible to claim that Torrance's philosophy of science is the final word or even to claim that any one of its implications is unique in the literature, it is certainly a noble attempt to make sense of both divine and created being in a way that remains rooted and grounded in Christian faith.

Conclusion

It has been the concern of this thesis to unpack and explore the major implications of Torrance's central epistemological claim that to know something authentically is to know it according to its nature (*kata physin*). This seemingly innocuous claim, as we have seen, has led to a somewhat lengthy discussion on a variety of topics.

First it was seen that kataphysic knowledge, as portrayed by Torrance, differs significantly from other forms of realism, lacking a significant number of characteristic terms and arguments to establish the reality of entities postulated by our theories. Next it was noted that, while much of what has gone by the name of "realism" has little to do with Torrance's position, it is not without antecedents but can be found, in various ways, in thinkers such as Athanasius, Anselm, Kierkegaard, and Clerk Maxwell, though the claim that these thinkers anticipate Torrance's own position to one degree or another has been shown to depend, at least in part, on Torrance's own idiosyncratic reading of their work. It was also argued that kataphysic thinking stands opposed to a variety of forms of dualism as well as the kind of positivism found among several thinkers in the first half of the twentieth century, such as A. J. Ayer. It was also argued that criticisms to the effect that Torrance himself harbors hidden dualistic tendencies, as suggested by John Douglas Morrison, are unfounded, at least in the form he articulates.

If it is true that authentic knowledge is gained only when we know something in accordance with its own nature, this has implications for our understanding of the stratification of our sciences. We found that, unless we are willing to condemn all the scientific knowledge we have gained thus far as inauthentic, we must reject a radical reductionism that claims that all our sciences can be reduced, whether in practice or in principle, to a single basic science. The order that arises at each level of our scientific inquiry seems to compel us to conclude that physical, chemical, and biological phenomena, to speak of no others, arise from distinct natures and it would be inappropriate to collapse them into just one.

Although Torrance sees his position as essentially uncontentious, it would be a mistake to believe that it is truly theory-independent. There are particular convictions it rests upon, without which it would be entirely unintelligible. If we are to know something truly only when we know it according to its nature, two things must be the case. First, the object of our inquiry must exist even if we find, through investigation, that it is not as we thought it was at first. Second, we must have some kind of epistemic access to it. This is not to say that this access guarantees that we will immediately grasp this reality in all its depth, because our preconceived notions need to be broken down in order to know it in a manner true to its own nature. However, we must have epistemic access that is *reliable*. Without this we would be unable to make subsequent contact with the reality under investigation in order to test and correct our theoretical representations of it.

This acknowledgement that Torrance's position depends upon conditions which, in their very nature, can be neither verified nor falsified, pushed us to investigate the place and function of what Torrance calls "ultimate beliefs." We saw that, according to Torrance, ultimate beliefs are beliefs that we are obligated to hold due to the fact that reality is what it is and not something else. Such beliefs are unavoidable but do not falsify knowledge gained in light of them. Torrance also acknowledges the existence of penultimate beliefs, beliefs which seem to be ultimate but for which reasonable alternatives exist. Both one's ultimate and penultimate beliefs together form the background of the entirety of one's knowledge at any given time and are what Torrance calls one's framework of thought.

The moment that anyone, especially a theist, acknowledges that unverifiable and unfalsifiable beliefs not only play a role in knowledge but play an *indispensable* role in knowledge, two concerns may be brought forward: that this theist is a fideist or that they are a foundationalist. To my knowledge, Torrance has never been explicitly charged with the former but it was shown that he would reject such a charge unless it was phrased in such a way as to claim that natural scientists are, by the nature of their discipline, also fideists. Since few would seem to be willing to make this charge, it may be dismissed. Some, such as Ronald Thiemann, whose critique was followed up by Morrison, have brought the charge of foundationalism against Torrance. As we have

seen, this charge rests upon a significant misunderstanding of Torrance's position and a more careful reading of Torrance's work reveals it to be mistaken.

The inescapability of ultimate and penultimate beliefs carries with it an inability to utterly transcend the subject-object relationship. This, in turn, challenges the traditional notion of objectivity which would attempt to isolate objective elements in our knowledge from subjective elements. If this cannot be done, one is tempted to believe that there can be no escape from a radical subjectivism. Torrance makes it clear, however, that though we cannot transcend the subject-object relation, we need not be entirely trapped within it. We are able, through considering subject-subject-object relations, sometimes called intersubjectivity, and subject-object-object relations, to keep our subjective whims and fantasies in check to a significant degree.

This acknowledgement, that one can never utterly separate objective elements of our knowledge from subjective elements seems to play havoc with the traditional notion of "truth." If we cannot ever transcend the subject-object relation, we are never able to state entirely unambiguously what "is the case." If this is so, then the understanding of truth going back to Aristotle, where truth "consists in saying of that which is that it is, or of that which is not that it is not" while falsehood "consists in saying of that which is that it is not, or of that which is not that it is" is never strictly applicable.

Torrance rejects the idea that truth is primarily something that characterizes our statements but rather is something that is a property of reality itself. By being what it is, reality possesses a "truth" far deeper and richer than we could ever hope to articulate in statements. This seems to be congenial to Torrance's Christian faith which claims that truth is primarily to be found in the *person* of Christ rather than any statement *about* Christ. While some will doubtless be displeased with such a transformation of the concept of truth, preferring to speak of "reality" rather than "truth of being," it brings a significant degree of simplicity and clarity to Torrance's thinking, though we have found that it is important to distinguish Torrance's use of "truth" from other ontological understandings of truth, such as that found in the work of Thomas Aquinas.

If the truth of being, or reality, is allowed to have priority over all our statements about it, it explains why we are not able to transcend the subject-object relation. If our knowledge is gained primarily by contact *with* reality rather than through statements

about reality, then we can never abstain from acknowledging that it is always we, the knowing subjects, that know reality, thus acknowledging the inescapability of the subject-object relation. This, in turn, is what gives rise to ultimate and penultimate beliefs, the stratification of our sciences, and the rejection of dualism and positivism.

More significant than its ability to shed light on Torrance's other concerns, this alternative notion of truth undergirds an epistemological tool that seems to provide one way to cut through a longstanding debate within the philosophy of science. The granting (or acknowledging) of the priority of the truth of being over the truth of statement paves the way for the development of what Torrance calls "disclosure models." Disclosure models function in many ways like scientific theories and paradigms in the sense that they seek to give an account of how things are, independently of them. What differentiates disclosure models from some accounts of scientific theories is that the former are self-consciously tentative and acknowledge the fact that, by their very nature, they fall short of the reality of which they are hoping to provide an account.

We have seen that Torrance claims that it is not appropriate to engage with reality on the basis of the assumption that any single disclosure model will be entirely appropriate. Just as reality is stratified, so are our theories. As we continue to engage with the object of our study, we take our basic empirico-theoretical data (we call this data "evangelical-doxological" within the context of Christian theology) and organize it into a coherent model which we then pose as a complex question to reality. In this way, we engage in something like Popper's falsification program (though it is more flexible than Popper's approach) where we test our disclosure models for accuracy and comprehensiveness. Eventually, we are pressed by our scientific engagement with a given reality to develop a higher theoretical model of that reality, as simple and as comprehensive as possible. Though the nature of this higher level theory requires it to be tested in a somewhat different manner than lower level theories, it is still subject to revision in light of new discoveries and insights.

Torrance's theory of disclosure models seems to account for actual scientific practice admirably. It allows for the very real desire that we should be able to verify and falsify our theoretical claims without making such concerns monolithic. It places the

emphasis on reality rather than any particular theoretical formulation *of* reality. We have also seen that Torrance's disclosure models provide one way to cut through some of the debate between scientific realism and scientific anti-realism in the form it has taken since Kuhn brought the notion of paradigms and paradigm shifts to general attention.

We brought Torrance into dialogue with the mainstream of secular philosophy of science throughout his career in order to reveal ways in which Torrance's distinctly Christian convictions enabled him to think about science in a different way than that found within that mainstream and provided different solutions to perennial problems. Though Torrance displayed passionate interest in the findings and practice of natural scientists, his contribution to the theology-science dialogue could have been increased if he had engaged more fully with natural science beyond his favorite handful of topics and scientists within the physical sciences.

While it seems clear that we must move beyond Torrance's understanding of science and epistemology at points and correct him at others, it seems he provides a helpful model of the kind of way a theologian can creatively engage with the findings of modern science. It remains the task of those who would follow in Torrance's footsteps to one degree or another to learn not only from his insights, but also from his blind spots.

Bibliography

- Achtemeier, P. Mark. "Natural Science and Christian Faith in the Thought of T. F. Torrance." In *The Promise of Trinitarian Theology: Theologians in Dialogue with T. F. Torrance*, edited by Colyer, Elmer M., 269-302: Rowman & Littlefield, 2001.
- . "The Truth of Tradition, Critical Realism in the Thought of Alasdair MacIntyre and T. F. Torrance." *Scottish Journal of Theology* 47, no. 3 (1994): 355-374.
- Amesbury, Richard. "Fideism" In *The Stanford Encyclopedia of Philosophy* (Winter 2012 Edition), Edward N. Zalta (ed.), Accessed on 28 January, 2014, <http://plato.stanford.edu/archives/win2012/entries/fideism>.
- Anselm. *Anselm of Canterbury: The Major Works*, edited by Davies, Brian, G. R. Evans. Oxford: Oxford University Press, 1998.
- . "On Truth." In *Anselm of Canterbury: The Major Works [De Veritate]*. Translated by McNerny, Ralph, edited by Davies, Brian and G. R. Evans, 151-174. Oxford: Oxford University Press, 1998.
- Aristotle. *Aristotle's Metaphysics*. Everyman's Library. Translated by Warrington, John. London: J. M. Dent & Sons LTD, 1956.
- Athanasius. *On the Incarnation*. Translated by Behr, John. Yonkers, New York: St. Vladimir's Seminary Press, 2011.
- Ayer, Alfred Jules. *Language, Truth and Logic*. London: Victor Gollancz LTD, 1964.
- Bachelard, Gaston. "The Philosophical Dialectic of the Concepts of Relativity." In *Albert Einstein: Philosopher-Scientist*, edited by Schilpp, Paul Arthur, 563-580. La Salle, Ill.: Open Court, 1970.
- Bacon, Francis. *Novum Organum: With Other Parts of the Great Instauration*. Translated by Urbach, Peter and John Gibson, edited by Urbach, Peter, John Gibson. Chicago: Open Court, 1994.
- Bhaskar, Roy. *The Possibility of Naturalism*. 3rd ed. London: Routledge, 1998.
- . *A Realist Theory of Science*. 3rd ed. London: Verso, 2008.
- . *Scientific Realism and Human Emancipation*. London: Routledge, 1986.
- Bhaskar, Roy and Christopher Norris. "Roy Bhaskar Interviewed," Accessed 08/13, 2013, http://www.criticalrealism.com/archive/rbhaskar_rbi.html.
- Born, Max. "Einstein's Statistical Theories." In *Albert Einstein: Philosopher-Scientist*,

- edited by Schilpp, Paul Arthur. Vol. 7, 163-177. La Salle, Ill.: Open Court, 1970.
- Calvin, John. *The Institutes of the Christian Religion*. Translated by Battles, Ford Lewis, edited by McNeill, John T. Philadelphia: Westminster Press, 1960.
- Cassidy, James J. "T. F. Torrance's Realistic Soteriological Objectivism and the Elimination of Dualisms: Union with Christ in Current Perspective." *Mid-America Journal of Theology* 19, no. 165 (2008): 194.
- Chisholm, Roderick M., Paul Weiss, and Wilfred Sellars. "Comments on Mr. Hempel's Theses." *The Review of Metaphysics* 5, no. 4 (Jun, 1952): 622-627.
- Colyer, Elmer M. *How to Read T. F. Torrance: Understanding His Trinitarian and Scientific Theology*. Illinois: Intervarsity Press, 2001.
- . *The Nature of Doctrine in the T. F. Torrance's Theology*. Eugene, OR: Wipf and Stock, 2001.
- . *The Promise of Trinitarian Theology: Theologians in Dialogue with T. F. Torrance*. Rowman & Littlefield, 2001.
- . "Review of: The Christian Doctrine of God, One being Three Persons. by Thomas F. Torrance." *Scottish Journal of Theology* 50, (1997): 389-391.
- . "A Scientific Theological Method." In *The Promise of Trinitarian Theology: Theologians in Dialogue with T. F. Torrance*, edited by Colyer, Elmer M., 205-237: Rowman & Littlefield, 2001.
- Copleston, Frederick. *A History of Philosophy*. Revised ed. Vol. 1. Westminster, MD: The Newman Press, 1963.
- Daston, Lorraine and Peter Galison. *Objectivity*. New York: Zone Books, 2007.
- Davis, Martin M. "An Explanatory Account and Examination of the Doctrine of the Mediation of Jesus Christ in the Scientific Theology of T. F. Torrance." Ph.D., North-West University, 2012.
- Descartes, René. "Discourse on the Method & Meditations on First Philosophy." In *The Essential Descartes*, edited by Wilson, M., 106-223. New York: Meridian, 1983.
- Dew, James K. Jr. "Science as the *Ancilla Theologiae*: A Critical Assessment of Alister E. McGrath's Scientific Theology from an Evangelical Philosophical/Theological Perspective." Ph.D, Southeastern Baptist Theological Seminary, 2008.
- Diller, Kevin S. "The Theology of Revelation and the Epistemology of Christian Belief: The Compatibility and Complementarity of the Theological Epistemologies of Karl Barth and Alvin Plantinga." PhD, University of St. Andrews, 2008.

- Duhem, Pierre. "Physical Theory and Experiment." In *Can Theories be Refuted: Essays on the Duhem-Quine Thesis*, edited by Harding, Sandra G., 1-40. Boston: D. Reidel Publishing Company, 1976.
- Einstein, Albert. "Autobiographical Notes." In *Albert Einstein: Philosopher-Scientist*, edited by Schilpp, Paul Arthur, 1-94. La Salle, Ill.: Open Court, 1970.
- . "Clerk Maxwell's Influence on the Evolution of the Idea of Physical Reality." In *The World as I See it*, 156-161. New York: Covici Publishing Company, 1934.
- . "The Fundamentals of Theoretical Physics." In *Out of My Later Years*, 98-110. New York: Philosophical Library, 1950.
- . "Inaugural Address to the Prussian Academy of Sciences (1914)." In *The World as I See it*, 127-130. New York: Covici Publishing Company, 1934.
- . "The Laws of Science and the Laws of Ethics." In *Out of My Later Years*, 114-115. New York: Philosophical Library, 1950.
- . "On the Method of Theoretical Physics." *Philosophy of Science* 1, no. 2 (1934): 163-169.
- . *Out of My Later Years*. New York: Philosophical Library, 1950.
- . "Physics and Reality." In *Out of My Later Years*, 59-97. New York: Philosophical Library, 1950.
- . "Principles of Scientific Research." In *The World as I See it*, 123-127. New York: Covici Publishing Company, 1934.
- . *Relativity, the Special and General Theory*. Translated by Lawson, Robert W. London: Methuen & Co. LTD, 1920.
- . "Remarks to the Essays Appearing in this Collective Volume." In *Albert Einstein: Philosopher-Scientist*, edited by Schilpp, Paul Arthur, 663-688. La Salle, Ill.: Open Court, 1970.
- . *The World as I See it*. New York: Covici Publishing Company, 1934.
- Einstein, Albert and Leopold Infeld. *The Evolution of Physics: The Growth of Ideas from the Early Concepts to Relativity and Quanta*. Cambridge: Cambridge University Press, 1938.
- Euclid. *The Thirteen Books of Euclid's Elements*. Translated by Heath, Thomas L. 2nd ed. Vol. 1. London: Cambridge University Press, 1926.
- Fergusson, David. "Meaning, Truth, and Realism in Bultmann and Lindbeck." *Religious Studies* 26, no. 2 (June, 1990): 183-198.

- Feyerabend, Paul K. *Against Method*. 3rd ed. London: Verso, 1993.
- . *Farewell to Reason*. London: Verso, 1987.
- . *Knowledge, Science and Relativism: Philosophical Papers Volume 3*, edited by Preston, John. Cambridge: Cambridge University Press, 1999.
- . *Problems of Empiricism, Philosophical Papers, Vol. 2*. Cambridge: Cambridge University Press, 1981.
- . *Realism, Rationalism and the Scientific Method, Philosophical Papers, Vol. 1*. Cambridge: Cambridge University Press, 1981.
- . *Science in a Free Society*. London: London NLB, 1978.
- . *Three Dialogues on Knowledge*. Cambridge, Mass: Blackwell, 1991.
- Feynman, Richard. *The Character of Physical Law*. London: Cox and Wyman, Ltd., 1965.
- Fine, Arthur. "The Natural Ontological Attitude." In *Scientific Realism*, edited by Leplin, Jarrett, 83-107. Berkeley and Los Angeles, California: University of California Press, 1984.
- Frank, Philipp G. "Einstein, Mach, and Logical Positivism." In *Albert Einstein: Philosopher-Scientist*, edited by Schilpp, Paul Arthur, 269-286. La Salle, Ill.: Open Court, 1970.
- Geiger, H. "On the Scattering of the α -Particles by Matter." *Proceedings of the Royal Society of London* (August 1908): 174-177.
- Gettier, Edmund L. "Is Justified True Belief Knowledge?" *Analysis* 23, no. 6 (June, 1963): 121-123.
- Goard, Brian Lee. "Theology and Reality: Critical Realism in the Thought of Alister E. McGrath." Ph.D., Southern Baptist Theological Seminary, 2011.
- Goodman, Nelson. *Fact, Fiction, and Forecast*. 4th ed. Cambridge, Massachusetts: Harvard University Press, 1983.
- Gray, Bryan J. "Towards Better Ways of Reading the Bible." *Scottish Journal of Theology* 33, (1980): 301-315.
- Grosso, Andrew Thomas. "Personal Being: Polanyi, Ontology, and Christian Theology." Ph.D., Marquette University, 2004.
- Habets, Myk. "The Doctrine of Election in Evangelical Calvinism: T. F. Torrance as a Case Study." *Irish Theological Quarterly* 73, (2008): 334-354.

- Hanna, Martin. "The Use of Science in Theology: Case Studies of Thomas F. Torrance and Langdon B. Gilkey." Ph.D., Andrews University, Seventh-day Adventist Theological Seminary, 2007.
- Harding, Sandra G., ed. *Can Theories be Refuted?: Essays on the Duhem-Quine Thesis*. Boston, MA: D. Reidel Publishing Company, 1976.
- Hardy, Daniel W. "Thomas F. Torrance." In *The Modern Theologians: An Introduction to Christian Theology in the Twentieth Century*, edited by Ford, David F. Vol. 1, 70-99. New York: Basil Blackwell, 1989.
- Harré, Rom, ed. *Problems and Obstacles to Progress in the Sciences*. The Herbert Spencer Lectures, 1973. Vol. 1975. Oxford: Clarendon Press.
- Hempel, Carl G. "Some Theses on Empirical Certainty." *The Review of Metaphysics* 5, no. 4 (Jun, 1952): 621-622.
- Hitchcock, Christopher, ed. *Contemporary Debates in Philosophy of Science*. Malden, MA: Blackwell, 2004.
- Hume, David. *An Enquiry Concerning Human Understanding*. Oxford World's Classics., edited by Millican, Peter. Oxford: Oxford University Press, 2007.
- Kaiser, Christopher B. "Humanity in an Intelligible Cosmos: Non-Duality in Albert Einstein and Thomas Torrance." In *The Promise of Trinitarian Theology: Theologians in Dialogue with T. F. Torrance*, edited by Colyer, Elmer M., 239-267: Rowman & Littlefield, 2001.
- Kierkegaard, Søren. *Philosophical Fragments*. Translated by Howard V. Hong and Edna H. Hong. Princeton, NJ: Princeton University Press, 1985.
- Klinefelter, Donald S. "God and Rationality: A Critique of the Theology of Thomas F. Torrance." *The Journal of Religion* 53, (1973): 117-35.
- Kruger, C. Baxter. "The Doctrine of the Knowledge of God in the Theology of T. F. Torrance: Sharing in the Son's Communion with the Father." *Scottish Journal of Theology* 43, (1985): 366-89.
- . "The Doctrine of the Knowledge of God in the Theology of T. F. Torrance: Sharing in the Son's Communion with the Father in the Spirit." *Scottish Journal of Theology* 43, no. 3 (1990): 366-389.
- Kuhn, Thomas S. *The Essential Tension: Selected Studies in Scientific Tradition and Change*. Chicago: University of Chicago Press, 1977.
- . "Logic of Discovery Or Psychology of Research?" In *Criticism and the Growth of Knowledge: Proceedings of the International Colloquium in the Philosophy of Science, London, 1965, Volume 4*, edited by Lakatos, Imre and Alan

- Musgrave, 1-23. Cambridge: Cambridge University Press, 1970.
- . "Reflections on My Critics." In *Criticism and the Growth of Knowledge: Proceedings of the International Colloquium in the Philosophy of Science, London, 1965, Volume 4*, edited by Lakatos, Imre and Alan Musgrave, 231-278. Cambridge: Cambridge University Press, 1970.
- . *The Structure of Scientific Revolutions*. 3rd ed. Chicago: University of Chicago Press, 1996.
- Kukla, André. *Studies in Scientific Realism*. Oxford: Oxford University Press, 1998.
- Kukla, André and Joel Walmsley. "A Theory's Predictive Success does Not Warrant Belief in the Unobservable Entities it Postulates." In *Contemporary Debates in Philosophy of Science*, edited by Hitchcock, Christopher, 133-148. Malden, MA: Blackwell, 2004.
- Labron, Tim. *Wittgenstein and Theology*. London: T&T Clark, 2009.
- Lakatos, Imre. "Falsification and the Methodology of Scientific Research Programmes." In *Criticism and the Growth of Knowledge: Proceedings of the International Colloquium in the Philosophy of Science, London, 1965, Volume 4*, edited by Lakatos, Imre and Alan Musgrave, 91-196. Cambridge: Cambridge University Press, 1970.
- Lakatos, Imre and Alan Musgrave, eds. *Criticism and the Growth of Knowledge. Proceedings of the International Colloquium in the Philosophy of Science, London, 1965*. Cambridge: Cambridge University Press, 1970.
- Langford, Thomas A. "T. F. Torrance's *Theological Science: A Reaction*." *Scottish Journal of Theology* 25, (1972): 155-70.
- Laplace, Pierre Simon. *A Philosophical Essay on Probabilities*. Translated by Truscott, Frederick Wilson and Frederick Lincoln Emory. New York: John Wiley & Sons, 1902.
- Laudan, Larry. "A Confutation of Convergent Realism." In *Scientific Realism*, edited by Leplin, Jarrett, 218-249. Berkeley and Los Angeles, California: University of California Press, 1984.
- . *Progress and its Problems*. Berkeley, CA: University of California Press, 1977.
- Laudan, Larry and Jarrett Leplin. "Empirical Equivalence and Underdetermination." *The Journal of Philosophy* 88, no. 9 (Sep. 1991): 449-472.
- Lenzen, Victor F. "Einstein's Theory of Knowledge." In *Albert Einstein: Philosopher-Scientist*, edited by Schilpp, Paul Arthur, 355-384. La Salle, Ill.: Open Court, 1970.

- Leplin, Jarrett, ed. *Scientific Realism*. Berkeley and Los Angeles: University of California Press, 1984.
- . "Surrealism." *Mind* 96, no. 384 (1987).
- . "A Theory's Predictive Success can Warrant Belief in the Unobservable Entities it Postulates." In *Contemporary Debates in Philosophy of Science*, edited by Hitchcock, Christopher, 117-132. Malden, MA: Blackwell, 2004.
- Lessing, Gotthold Ephraim. "On the Proof of the Spirit and of Power." In *Philosophical and Theological Writings*. Translated by Nisbet, H. B., edited by Nisbet, H. B., 83-88. Cambridge: Cambridge University Press, 2005.
- . *Philosophical and Theological Writings*. Cambridge Texts in the History of Philosophy., edited by Ameriks, Karl, Desmond M. Clarke. Translated by Nisbet, H. B., edited by Nisbet, H. B. Cambridge: Cambridge University Press, 2005.
- Lindbeck, George A. *The Nature of Doctrine: Religion and Theology in a Postliberal Age*. London: SPCK, 1984.
- Llewelyn, John E. "Collingwood's Doctrine of Absolute Presuppositions." *The Philosophical Quarterly* 11, no. 42 (Jan, 1961): 49-60.
- Losch, Andreas. "On the Origins of Critical Realism." *Theology and Science* 7, no.1 (2009): 85-106.
- Luoma, Tapio. *Incarnation and Physics: Natural Science in the Theology of Thomas F. Torrance*. Oxford: Oxford University Press, 2003.
- Lyotard, Jean-François. *The Postmodern Condition: A Report on Knowledge*. Translated by Bennington, Geoff and Brian Massumi. Minneapolis: University of Minnesota Press, 1979.
- MacIntyre, Alasdair. *Whose Justice? Which Rationality?* London: Duckworth, 1988.
- Martin, Robert K. "The Incarnate Ground of Christian Education: The Integration of Epistemology and Ontology in the Thought of Michael Polanyi and Thomas F. Torrance." PhD, Princeton Theological Seminary, 1994.
- McCall, Tom. "Ronald Thiemann, Thomas Torrance and Epistemological Doctrines of Revelation." *International Journal of Systematic Theology* 6, no. 2 (2004): 148-168.
- McGrath, Alister. *The Genesis of Doctrine: A Study in the Foundation of Doctrinal Criticism*. Oxford: Blackwell, 1990.
- . *A Scientific Theology, Vol. 1 - Nature*. Edinburgh: T & T Clark, 2001.

- . *A Scientific Theology, Vol. 2 - Reality*. Edinburgh: T & T Clark, 2002.
- . *A Scientific Theology, Vol. 3 - Theory*. Edinburgh: T & T Clark, 2003.
- . *T. F. Torrance, an Intellectual Biography*. Edinburgh: T & T Clark, 1999.
- McMullin, Ernan. "A Case for Scientific Realism." In *Scientific Realism*, edited by Leplin, Jarrett, 8-40. Berkeley and Los Angeles, California: University of California Press, 1984.
- Meyer, Raymond K. "An Evangelical Analysis of the Critical Realism and Corollary Hermeneutics of Bernard Lonergan with Application for Evangelical Hermeneutics." Ph.D., Southeastern Baptist Theological Seminary, 2007.
- Milbank, John. *Theology and Social Theory: Beyond Secular Reason*. 2nd ed. Oxford: Blackwell, 2006.
- Mitchell, Mark T. "Natural Law: The Tacit Dimension." Ph.D., Georgetown University, 2001.
- Molnar, Paul D. "God's Self-Communication in Christ: A Comparison of Thomas F. Torrance and Karl Rahner." *Scottish Journal of Theology* 50, no. 3 (1997): 288-320.
- . *Thomas F. Torrance: Theologian of the Trinity*. Burlington, VT : Ashgate Pub. Ltd., 2009.
- Morrison, John D. "Heidegger, Correspondence Truth and the Realist Theology of Thomas Forsyth Torrance." *Evangelical Quarterly* 69, no. 2 (1997): 139-155.
- . *Knowledge of the Self-Revealing God in the Thought of Thomas Forsyth Torrance*. New York: Peter Lang, 1997.
- . "Thomas Forsyth Torrance's Critique of Evangelical (Protestant) Orthodoxy." *Evangelical Quarterly* 67, no. 1 (1995): 53-69.
- . "Thomas Torrance's Reformulation of Karl Barth's Christological Rejection of Natural Theology." *Evangelical Quarterly* 73, no. 1 (2001): 59-75.
- Munchin, David. "Is Theology a Science? Paul Feyerabend's Anarchic Epistemology as Challenge Test to T. F. Torrance's Scientific Theology." *Scottish Journal of Theology* 64, (Nov. 2011), : 439-455.
- . *Is Theology a Science?: The Nature of the Scientific Enterprise in the Scientific Theology of Thomas Forsyth Torrance and the Anarchic Epistemology of Paul Feyerabend*. Studies in Systematic Theology., edited by Bevans, S. V. D., Miikka Ruokanen. Vol. 7. Leiden, The Netherlands: Koninklijke Brill, NV, 2011.

- Murphy, Nancey. *Theology in the Age of Scientific Reasoning*. Ithaca: Cornell University Press, 1990.
- Myers, Benjamin. "The Stratification of Knowledge in the Thought of T. F. Torrance." *Scottish Journal of Theology* 61, no. 1 (2008): 1-15.
- Neidhardt, Walter J. "Theology and Science: At the Frontiers." *Theology Today* 50, no. 3 (1993): 449-455.
- . "Thomas F. Torrance's Integration of Judeo-Christian Theology & Natural Science: Some Key Themes." *Perspectives of Science and Christian Faith* 41, (1989): 87-98.
- Newbigin, Lesslie. *The Gospel in a Pluralist Society*. Grand Rapids, MI: Wm. B. Eerdmans, 1989.
- Newton, Isaac. *Opticks: Or a Treatise of the Reflections, Refractions, Inflections & Colours of Light*. Fourth ed. London: G. Bell & Sons, LTD., 1931.
- . *The Principia: Mathematical Principles of Natural Philosophy*. Translated by Cohen, I. Bernard and Anne Whitman. Berkeley and Los Angeles, California: University of California Press, 1999.
- Norris, Christopher. *Against Relativism: Philosophy of Science, Deconstruction, and Critical Theory*. Oxford: Blackwell, 1997.
- Northrop, F. S. C. "Einstein's Conception of Science." In *Albert Einstein: Philosopher-Scientist*, edited by Schilpp, Paul Arthur, 385-408. La Salle, Ill.: Open Court, 1970.
- Norton, John D. "Why Thought Experiments do Not Transcend Empiricism." In *Contemporary Debates in Philosophy of Science*, edited by Hitchcock, Christopher, 44-66. Malden, MA: Blackwell, 2004.
- Plantinga, Alvin. *The Analytic Theist : An Alvin Plantinga Reader*, edited by Sennett, J. Grand Rapids, Mich: W. B. Eerdmans Pub. Co., 1998.
- . "Reason and Belief in God." In *The Analytic Theist*, edited by Sennett, James F., 102-161. Grand Rapids, MI: W. B. Eerdmans, 1998.
- . *Warrant and Proper Function*. New York: Oxford University Press, 1993.
- . *Warrant: The Current Debate*. New York: Oxford University Press, 1993.
- . *Warranted Christian Belief*. New York: Oxford University Press, 2000.
- Plato. "Cratylus." In *The Works of Plato*. Translated by Taylor, Thomas and Floyer Sydenham. Vol. 5, 455-526. Chippenham, Wiltshire: Antony Rowe, 1996 (first in 1804).

- . *Meno*. Translated by Sharples, R. W., edited by Sharples, R. W. Warminster, Wiltshire: Aris & Phillips Ltd., 1985.
- Polanyi, Michael. *Knowing and being*. Chicago: University of Chicago Press, 1969.
- . *The Logic of Liberty; Reflections and Rejoinders*. London: Routledge, 1951.
- . *Personal Knowledge: Towards a Post-Critical Philosophy*. Chicago: University of Chicago Press, 1958.
- . *Science, Faith and Society*. Chicago: University of Chicago Press, 1964.
- . *The Tacit Dimension*. Magnolia, MA: Smith, 1983.
- Polanyi, Michael and H. Prosch. *Meaning*. Chicago: University of Chicago, 1977.
- Popper, Karl R. *Conjectures and Refutations: The Growth of Scientific Knowledge*. Fourth (Revised) ed. Frome and London: Butler & Tanner Limited, 1976.
- . *The Logic of Scientific Discovery*. London: Hutchinson of London, 1974.
- Prigogine, Ilya and Isabelle Stengers. *Order Out of Chaos: Man's New Dialogue with Nature*. London: Heineman, 1984.
- Psillos, Stathis. *Scientific Realism: How Science Tracks Truth*. Philosophical Issues in Science., edited by Newton-Smith, W. H. New York: Routledge, 1999.
- Purves, Andrew. "The Christology of Thomas F. Torrance." In *The Promise of Trinitarian Theology: Theologians in Dialogue with T. F. Torrance*, edited by Colyer, Elmer M., 51-80: Rowman & Littlefield, 2001.
- Putnam, Hilary. "Three Kinds of Scientific Realism." *The Philosophical Quarterly* 32, no. 128 (Jul, 1982): 195-200.
- . "What is Realism," In *Scientific Realism*, edited by Leplin, Jarrett, 140-153. Berkeley and Los Angeles, California: University of California Press, 1984.
- Quine, W. V. O. *From a Logical Point of View*. Revised ed. New York: Harper Torchbook, 1953.
- . "On What There Is." In *From a Logical Point of View*. Revised ed., 1-19. New York: Harper Torchbook, 1953.
- . "Two Dogmas of Empiricism." In *From a Logical Point of View*. Revised ed., 20-46. New York: Harper Torchbook, 1953.
- . *Word and Object*. Cambridge, Massachusetts: The M.I.T. Press, 1960.

- Rorty, Richard. *Philosophy and the Mirror of Nature*. Princeton, NJ: Princeton University Press, 1980.
- Rutherford, E. "The Scattering of α and β Particles by Matter and the Structure of the Atom." *Philosophical Magazine* 6, no. 21 (May, 19): 669-688.
- Schilpp, Philp, ed. *Albert Einstein: Philosopher-Scientist*. La Salle, Ill.: Open Court, 1970.
- Schubert, Frank D. "Thomas F. Torrance: The Case for a Theological Science." *Encounter* 45, no. 2 (1984): 123-137.
- Seng, Kang Phee. "The Epistemological Significance of Ὁμοούσιον in the Theology of Thomas F. Torrance." *Scottish Journal of Theology* 45, no. 3 (1992): 341-366.
- Siemens, David F. Jr. "Two Problems with Torrance." *Perspectives on Science and Christian Faith* 43, (1991): 112-113.
- Simmons, Stephen Arthur. "The Semantics of God and Nature in the Writings of Thomas F. Torrance." Ph.D., University of Chicago, 1995.
- Stevick, Travis M. "Openness and Formal Logic in the Natural and Theological Sciences According to T. F. Torrance." *Participatio* 2 (Supp. Vol.), (2013): 37-66.
- . "Truth and Language in the Theology of T. F. Torrance." *Participatio* 2 (Supp. Vol.), (2013): 67-101.
- Swinburne, Richard. "Plantinga on Warrant." *Religious Studies* 37, no. 2 (June., 2001): 203-214.
- Tanchanpongs, Natee. "Discourse Toward Scripture: A Methodological Proposal for Evangelical Contextual Theology." Ph.D., Trinity Evangelical Divinity School, 2007.
- Tarski, Alfred. "Truth and Proof." *Scientific American* 220, no. 6 (1969): 63-77.
- Thiemann, Ronald. *Revelation and Theology: The Gospel as Narrated Promise*. Notre Dame: Notre Dame University Press, 1985.
- Thomson, J. J. "On the Structure of the Atom: an Investigation of the Stability and Periods of Oscillation of a Number of Corpuscles Arranged at Equal Intervals Around the Circumference of a Circle; with Application of the Results to the Theory of Atomic Structure." *Philosophical Magazine* 7, no. 39 (March, 1904): 237-265.
- Torrance, Thomas F. "The Historical Jesus: From the Perspective of a Theologian." In *The New Testament Age: Essays in Honor of Bo Reicke*, edited by Weinrich, William C. Vol. 2, 511-526. Macon, GA: Mercer, 1984.

- . *Atonement: The Person and Work of Christ*, edited by Walker, Robert T. Downer's Grove, IL: InterVarsity Press, 2009.
- . "The Atonement: The Singularity of Christ and the Finality of the Cross: The Atonement and the Moral Order." In *Universalism and the Doctrine of Hell*, edited by Cameron, Nigel M. de S., 225-256. Grand Rapids, MI: Baker Book House, 1992.
- . *The Being and Nature of the Unborn Child* Scottish Order of Christian Unity, 2000.
- . *Belief in Science and in Christian Life: The Relevance of Michael Polanyi's Thought for Christian Faith and Life*. Edinburgh: The Handsel Press, 1980.
- . "Bloesch's Doctrine of God." In *Evangelical Theology in Transition: Theologians in Dialogue with Donald Bloesch*, edited by Colyer, Elmer M., 136-148. Downers Grove, IL: Intervarsity Press, 1999.
- . "The Christian Apprehension of God the Father." In *Speaking the Christian God: The Holy Trinity and the Challenge of Feminism*, edited by Kimel, Alvin F., 120-143. Grand Rapids, MI: Eerdmans, 1992.
- . *The Christian Doctrine of God: One Being, Three Persons*. Edinburgh: T & T Clark, 1996.
- . *The Christian Frame of Mind*. Colorado Springs: Helmers and Howard, 1989.
- . *Christian Theology and Scientific Culture*. Oxford: Oxford University Press, 1980.
- . "The Deposit of Faith." *Scottish Journal of Theology* 36, no. 1 (1983): 1-28.
- . "The Distinctive Character of the Reformed Tradition." *Reformed Review* 54, no. 1 (2000): 5-16.
- . *Divine and Contingent Order*. Oxford: Oxford University Press, 1981.
- . "Divine and Contingent Order." In *The Sciences and Theology in the Twentieth Century*, edited by Peacocke, A. R., 81-97. Notre Dame, IN: University of Notre Dame Press, 1981.
- . *Divine Meaning: Studies in Patristic Hermeneutics*. Edinburgh: T & T Clark, 1995.
- . "The Divine Vocation and Destiny of Israeli in World History." In *The Witness of the Jews to God*, edited by Lyon, David H. S. and David W. Torrance, 85-104. Edinburgh: Handsel Press, 1982.

- . "The Eschatology of Faith: Martin Luther." In *Luther: Theologian for Catholics and Protestants*, edited by Yule, George, 145-213. Edinburgh: T & T Clark, 1985.
- . "Ethical Implications of Anselm's De Veritate." *Theologische Zeitschrift* 24, no. 5 (1968-09-01, 1968): 309-319.
- . "The Function of Inner and Outer Word in Lonergan's Theological Method." In *Looking at Lonergan's Method*, edited by Corcoran, Patrick, 101-126. Dublin: Talbot Press, 1975.
- . "Fundamental Issues in Theology and Science." In *Science and Religion: One World - Changing Perspectives on Reality*, edited by Fennema, J. W. and Paul Iain, 35-46. London: Kluwer Academic Publishing, 1990.
- . *God and Rationality*. Oxford: Oxford University Press, 1971.
- . "God and the Contingent World." *Zygon* 14, no. 4 (1979): 329-348.
- . "The Goodness and Dignity of Man in the Christian Tradition." In *Christ in our Place: The Humanity of God in Christ for the Reconciliation of the World: Essays Presented to Professor James Torrance*, edited by Hart, Trevor A. and Daniel P. Thimell, 369-387. Exeter: Paternoster Press, 1989.
- . *The Ground and Grammar of Theology*. Charlottesville, VA: The University Press of Virginia, 1981.
- . "Ground and Grammar of Theology, Lecture 2 Q&A." Grace Communion International, accessed March 18, 2014, <http://gcitv.net/download/MiscVid/TorranceGrammar-Tape2-QA.mp3>.
- . "Ground and Grammar of Theology, Lecture 3." Grace Communion International, accessed March 18, 2014, <http://gcitv.net/download/MiscVid/TorranceGrammar-Tape3.mp3>.
- . "Hermeneutics According to F. D. E. Schleiermacher." *Scottish Journal of Theology* 21, (1968): 257-67.
- . "The Hermeneutics of Erasmus." In *Probing the Reformed Tradition: Historical Studies in Honor of Edward A. Dowey Jr.*, edited by McKee, Elsie Anne and Brian G. Armstrong, 48-76. Louisville, KY: Westminster John Knox Press, 1989.
- . *The Hermeneutics of John Calvin*. Edinburgh: Scottish Academic Press, 1988.
- . "The Hermeneutics of John Reuchlin." In *Church, Word and Spirit: Historical and Theological Essays in Honor of Geoffrey W Bromiley*, edited by Bradley, James E. and Richard A. Muller, 107-121. Grand Rapids, MI: Eerdmans, 1987.

- . *Incarnation: The Person and Life of Christ*, edited by Walker, Robert T. Downer's Grove, IL: InterVarsity Press, 2008.
- . "Influence of Reformed Tradition on the Development of Scientific Method." *Dialog: A Journal of Theology* 2, no. 1 (1963): 40-49.
- . *Juridical Law and Physical Law*. 2nd ed. Eugene, CO: Wipf and Stock, 1997.
- . "Karl Barth and Patristic Theology." In *Theology Beyond Christendom: Essays on the Centenary of the Birth of Karl Barth, May 10, 1886.*, edited by Thompson, John, 215-239. Eugene, OR: Wipf & Stock, 1986.
- . *Karl Barth: An Introduction His Early Theology, 1910-1931*. London: SCM Press, 1962.
- . "The Legacy of Karl Barth." *Scottish Journal of Theology* 39, no. 3 (1986): 289-308.
- . "Legal and Evangelical Priests: The Holy Ministry as Reflected in Calvin's Prayers." In *Calvin's Books: Festschrift Dedicated to Peter De Klerk on the Occasion of His Seventieth Birthday*, edited by Neuser, Wilhelm H., Herman J. Selderhuis and W. Spijker, 63-74. Heerenveen: J. J. Groen, 1997.
- . *The Mediation of Christ*. Revised ed. Colorado Springs, CO: Helmers and Howard, 1992.
- . "The Ministry of Women." In *The Call to Serve: Biblical and Theological Perspectives on Ministry in Honour of Bishop Penny Jamieson*, edited by Campbell, Douglas A., 269-284. Sheffield, England: Sheffield Academic, 1996.
- . "My Interaction with Karl Barth." In *How Karl Barth Changed My Mind*, edited by McKim, Donald, 52-64. Grand Rapids, MI.: W. B. Eerdmans Pub. Co., 1986.
- . "The Open Texture of Faith and Godliness in the Church's Confession." In *Aksum, Thyateira: A Festschrift for Archbishop Methodios of Thyateira and Great Britain*, edited by Dragas, George D., 143-154. London: Thyateira House, 1985.
- . "The Place of Word and Truth in Theological Inquiry According to St. Anselm." In *Studia Medievalia Et Mariologica, P. Carolo Balic OFM Septvagesium Explendi Annum Dicta*, edited by Zavalloni, P., 131-160. Rome: Antonianum, 1971.
- . *Preaching Christ Today: The Gospel and Scientific Thinking*. Grand Rapids, MI: Wm. B. Eerdmans, 1994.
- . *Reality and Evangelical Theology*. Philadelphia: Westminster Publishing Co., 1982.

- . *Reality and Scientific Theology*. Revised 2002, Wipf and Stock ed. Edinburgh: Scottish Academic Press, 1981.
- . "The Reconciliation of Mind: A Theological Meditation upon the Teaching of St. Paul." In *Theology in the Service of the Church: Essays in Honor of Thomas W. Gillespie*. Grand Rapids, Mich: W. B. Eerdmans Pub., 2000.
- . "Review of Martin Heidegger, *Being and Time*, Translated by John Macquarrie and Edward Robinson." *Journal of Theological Studies* 15, (1964): 471-486.
- . "Science and Access to God: Epistemological Perspectives." *Jian Dao* 10, (1998): 43-58.
- . "Scientific Hermeneutics According to St. Thomas Aquinas." *Journal of Theological Studies* 13, (1962): 259-89.
- . "The Significance of John Philoponos as a Forerunner of James Clerk Maxwell." *CGST Journal* 30, (2001): 187-199.
- . "The Soul and Person, in Theological Perspective." In *Religion, Reason, and the Self: Essays in Honour of Hywel D. Lewis*, edited by Brown, Stuart, 103-118. Cardiff: University of Wales Press, 1989.
- . *Space, Time and Incarnation*. Oxford: Oxford University Press, 1969.
- . *Space, Time and Resurrection*. Grand Rapids: Wm. B. Eerdmans Publishing Company, 1976.
- . "The Substance of Faith." In *Toward the Future of Reformed Theology: Tasks, Topics, Traditions*, edited by Willis, David and Michael Welker, 167-177. Grand Rapids, MI: W. B. Eerdmans, 1999.
- . "Theological Realism." In *The Philosophical Frontiers of Christian Theology: Essays Presented to D. M. MacKinnon*, 169-96. Cambridge: Cambridge University Press, 1982.
- . *Theological Science*. Oxford: Oxford University Press, 1969.
- . *Theology in Reconciliation: Essays Towards Evangelical and Catholic Unity in East and West*. Grand Rapids: Wm. B. Eerdmans Publishing Company, 1975.
- . *Theology in Reconstruction*. Grand Rapids: Wm. B. Eerdmans Publishing Company, 1965.
- . "Thomas Torrance Responds." In *The Promise of Trinitarian Theology: Theologians in Dialogue with T. F. Torrance*, edited by Colyer, Elmer M., 303-340: Rowman & Littlefield, 2001.

- . "Time in Scientific and Historical Research." In *Gottes Zukunft, Zukunft Der Welt: Festschrift Für Jürgen Moltmann Zum 60. Geburtstag*, edited by Deuser, Hermann, Gerhard Marcel Martin, Konrad Stock and Michael Welke, 292-297. München: Chr. Kaiser, 1986.
- . *Transformation and Convergence in the Frame of Knowledge*. Grand Rapids: Wm. B. Eerdmans Publishing Company, 1984.
- . "Transformation in the Frame of Knowledge." In *In Necessariis Unitas: Mélanges Offerts à Jean-Louis Leuba*, edited by Stauffer, Richard, 397-404. Paris: Cerf, 1984.
- . *The Trinitarian Faith: The Evangelical Theology of the Ancient Catholic Church*. Edinburgh: T. and T. Clark, 1988.
- . "The Trinitarian Foundation and Character of Faith and of Authority in the Church." In *Theological Dialogue between Orthodox and Reformed Churches*, edited by Torrance, Thomas F. Vol. 1, 79-120. Edinburgh: Scottish Academic Press, 1985.
- . *Trinitarian Perspectives: Toward Doctrinal Agreement*. Edinburgh: T & T Clark, 1994.
- . "The Triunity of God in the Nicene Theology of the Fourth Century." In *Theological Dialogue between Orthodox and Reformed Churches*, edited by Torrance, Thomas F. Vol. 2, 3-37. Edinburgh: Scottish Academic Press, 1993.
- . "The Uniqueness of Divine Revelation and the Authority of the Scriptures: The Creed Association's Statement." *Scottish Bulletin of Evangelical Theology* 13, (1995): 97-101.
- Torrance, Thomas F., ed. *The Incarnation: Ecumenical Studies in the Nicene-Constantinopolitan Creed A.D. 381*. Edinburgh: Handsel Press, 1981.
- Trook, Douglas A. "The Unified Christocentric Field: Toward a Time Eternity Relativity Model for Theology in the an-/Enhypostatic Theology of Thomas F. Torrance." Unpublished Ph.D Thesis., Drew University, 1985.
- Van Fraassen, Bas C. *The Scientific Image*. Oxford: Oxford University Press, 1980.
- Van Huyssteen, J. *Essays in Postfoundationalist Theology*. Grand Rapids, MI: William B. Eerdmans, 1997.
- Van Kooten Niekerk, Kees. "A Critical Realist Perspective on the Dialogue between Theology and Science." in *Rethinking Theology and Science: Six Models for the Current Dialogue*, edited by Gregersen, Niels Henrik and J. Wentzel Van Huyssteen, 51-86. Grand Rapids, MI: William B. Eerdmans Publishing Company, 1998.

- Webster, John. "T. F. Torrance on Scripture." *Scottish Journal of Theology* 65, no. 1 (2012): 34-63.
- Wenzl, Aloys. "Einstein's Theory of Relativity Viewed from the Standpoint of Critical Realism, and its Significance for Philosophy." In *Albert Einstein: Philosopher-Scientist*, edited by Schilpp, Paul Arthur, 581-606. La Salle, Ill.: Open Court, 1970.
- Wesley, John. "Sermon 130: On Living without God." In *The Works of John Wesley*, edited by Outler, Albert C. Vol. 4, 168-176. Nashville: Abingdon Press, 1987.
- . "Sermon 55: On the Trinity." In *The Works of John Wesley*, edited by Outler, Albert C. Vol. 2, 373-386. Nashville: Abingdon Press, 1985.
- . *The Works of John Wesley*. The Bicentennial Edition of the Works of John Wesley., edited by Baker, Frank, edited by Outler, Albert C. Vol. 2. Nashville: Abingdon Press, 1985.
- . *The Works of John Wesley*. The Bicentennial Edition of the Works of John Wesley., edited by Baker, Frank, edited by Outler, Albert C. Vol. 4. Nashville: Abingdon Press, 1987.
- Wittgenstein, Ludwig. *On Certainty*. edited by Anscombe, G. E. M., G. H. von Wright. New York: Harper Torchbook, 1972.
- . *Philosophical Investigations*. Translated by G. E. M. Anscombe. New York: MacMillan Publishing, 1968.
- . *Wittgenstein's Tractatus* [Tractatus Logico-Philosophicus]. Translated by Kolak, Daniel. Mountain View, California: Mayfield Publishing Company, 1998.
- Wood, William. "Thomas Aquinas on the Claim that God is Truth." *Journal of the History of Philosophy* 51, no. 1 (2013): 21-47.
- Worrall, John. "Structural Realism: The Best of both Worlds?" *Dialectica* 43, no. 1-2 (1989): 99-124.
- Yom, Aaron Y. "Rethinking Scientific Theology from a Pneumatological Perspective: Towards Constructing a Triadic Analogical Approach to Theological Science in Dialogue with Thomas F. Torrance." Ph.D., Regent University, 2013.