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The Use of Science in Theology: Case Studies of Thomas F. Torrance and Langdon B. Gilkey

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THE USE OF SCIENCE IN THEOLOGY: CASE STUDIES OF THOMAS F. TORRANCE AND LANGDON B. GILKEY

A Dissertation

Presented in Partial Fulfillment

of the Requirements for the Degree

Doctor of Philosophy

by

Martin Hanna

February 2004

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me focused on my responsibility to leave a legacy for those who come behind me.

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ABSTRACT

THE USE OF SCIENCE IN THEOLOGY: CASE STUDIES OF LANGDON B. GILKEY AND THOMAS F. TORRANCE

by

Martin Frederick Hanna

Adviser: Fernando Canale

ABSTRACT OF GRADUATE STUDENT RESEARCH

Dissertation

Andrews University

Seventh-day Adventist Theological Seminary

Title: THE USE OF SCIENCE IN THEOLOGY: CASE STUDIES OF LANGDON B. GILKEY AND THOMAS F. TORRANCE

Name of researcher: Martin Frederick Hanna

Name and degree of faculty adviser: Fernando Canale, Ph.D.

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Problem

The purpose of this dissertation is to address the problem of the use of science in theology in the writings of Thomas F. Torrance and Langdon B. Gilkey. Chapter 1 introduces the problem in terms of definitions of science and theology, and the history of the use of science in theology. Attention is given to definitions of science as exclusive or inclusive of theology; and to definitions of theology as the study of God and/or the study of divine revelation. The historical background to the problem is surveyed in terms of premodern, modern, and postmodern shifts in science and in the use of

scientific theory and method in theology.

Methodology

Chapters 2 and 3 analytically describe Torrance's and Gilkey's models for the use of science in theology. The following questions are addressed. Who are Torrance and Gilkey? Do they propose models for the use of science in theology? Are their models responsive to the postmodern shift in science, theology, and the use of science in theology? Are their models Christocentric, bibliocentric, or cosmocentric? Is a dialogical or dialectic/correlational model indicated in their references to the uses and the limits of the use of science in theology? Are the postmodern, dialogical, and dialectical elements of their models controlled by the Christocentric and cosmocentric structure of their models? Chapter 4 compares and contrasts their models. Chapter 5 summarizes the dissertation, its conclusions, and recommendations for further study.

Conclusions

In response to the postmodern shift, Torrance proposes a Christocentric-dialogical model for the use of science in theology while Gilkey proposes a cosmocentric-dialectical model. There is comparison and contrast between the models in each area evaluated in this study. From each other's perspectives, contrasting elements and elements of comparison

may indicate non-viability or viability of parts of their models. Another perspective would result from the use of a comprehensively revelational model based on biblical revelation. Such a model could provide a biblical interpretation of divine revelation in Christ and the cosmos and also be responsive to the postmodern shift in the use of science in theology.

CHAPTER I

THE USE OF SCIENCE IN THEOLOGY: INTRODUCTION AND HISTORICAL BACKGROUND

Introduction

Science and religion are arguably the two most powerful forces in human culture. The nature of relations between these forces has been explored and debated for millennia.[1] This dissertation continues that exploration and debate. This first chapter introduces the dissertation in terms of its (1) problem and purpose, (2) problem justification, (3) methodology, and (4) delimitations. This chapter also presents a historical background to this problem in terms of (1) premodern, (2) modern, and (3) postmodern periods.[2]

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[1]See Eugene Bewkes et al., *The Western Heritage of Faith and Reason* (New York: Harper and Row, 1963); Étienne Gilson, *Reason and Revelation in the Middle Ages* (New York: Charles Scribner's Sons, 1938), and the discussion below on Historical Background.

[2]On the subject of post-modernity see T. Finger, "Modernity, Postmodernity--What in the World Are They?"

Problem and Purpose

This dissertation addresses the problem of the use of science in the writings of Thomas Torrance (1913-) and Langdon Gilkey (1919-). Its purpose is to analyze, compare, and evaluate their models for the use of science in theology. This investigation will seek to (1) ascertain the inner coherence of each model; (2) find out whether their models contradict or complement each other; (3) identify some factors/components contributing to the differences and similarities in their models; and (4) identify implications and relevance of their models for the task of constructing an alternative model for the use of science in theology.[1]

Problem Justification

The need for a study of the problem introduced above may be justified, first, by a consideration of its semantic complexity. Second, the significance of Torrance's and

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Transformation 10 (1993): 353-368; T. Gitlin, "The Postmodern Predicament," *Wilson Quarterly* 13 (1989): 67-76; G. J. Percesepe, "The Unbearable Lightness of Being Postmodern," *Christian Scholar's Review* 20 (1990): 118-135; C. van Gelder, "Postmodernism as an Emerging World View," *Calvin Theological Journal* 26 (1991): 412-417. See also the section on The Postmodern Period below.

[1]See also the section on Methodology below.

Gilkey's models for the use of science in theology will be explored. This will involve a survey of their internal coherence and the comparison and contrast between them.

Semantic Complexity

Any model for the use of science in theology involves some conception of science and some conception of theology. However, as a result of the various conceptions of science and theology which have been proposed, the issue of the use of science in theology is marked by semantic complexity.[1]

First, semantic complexity is evident in the arguments which have been presented for and against a semantic distinction between science and theology. Some theologians such as Eta Linnemann prefer not to use the term *science* to denote "competent intellectual work in theology."[2] However,

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[1]David B. Wilson highlights the confusion that often results from this semantic complexity in his discussion and in the title of his chapter, "On the Importance of Eliminating *Science* and *Religion* from the History of Science and Religion," in *Facets of Faith and Science,* ed. Jiste M. van der Meer (Lanham, MD: University Press of America, 1996), 27-48.

[2]Eta Linnemann, *Historical Criticism of the Bible: Methodology or Ideology* (Grand Rapids, MI: Baker, 1990), 140; Larry Laudan, "Progress or Rationality? The Prospects for Normative Naturalism," *American Philosophical Quarterly* 24 (1987): 23-24.

others regard theology as one of the sciences. Herman Bavinck writes: "natural science is not the only science, and cannot be."[1] In harmony with Bavinck's perspective, Carl Raschke suggests that it is actually the element of *scientia* in theology that keeps it viable.[2]

Second, semantic complexity is evident in the different definitions of science reflected in different languages. In English, *science* often denotes natural science. However, in German, *wissenchaft* denotes a "rational, academic discipline" or "field of knowledge." The German usage follows the older Latin *scientia* which denotes "disciplined methodological knowledge in any realm of human inquiry"[3] including theology.

Third, therefore, on the one hand, science may be

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[1]Herman Bavinck, *The Philosophy of Revelation* (Grand Rapids, MI: Eerdmans, 1953), 84-85; James Brown, *The Rational and the Social* (New York: Routledge, 1989), 117ff.

[2]Carl Raschke, *Theological Thinking: An Inquiry* (Atlanta, GA: Scholars Press, 1988), 19. See also Del Ratzsch, *Philosophy of Science* (Downers Grove, IL: InterVarsity, 1986), 9, 13; Harold Brown, "On Method and Means in Theology," in *Doing Theology in Today's World*, ed. John Woodbridge and Thomas McComiskey (Grand Rapids, MI: Zondervan, 1991), 147-170.

[3]Peter C. Hodgson, "Review of *Theology and the Philosophy of Science*," *Religious Studies Review* 3 (1977): 216.

defined inclusively to denote knowledge and methods of gaining knowledge, including knowledge of God (*theologia*). On the other hand, in exclusive definitions, science may denote knowledge and methods of gaining knowledge of nature (including human nature); and theology may denote knowledge or methods of gaining knowledge of divine nature.[1] Mark Kalthoff suggests that exclusive definitions of science and theology distort the historical reality of the use of science in theology.[2] However, Robert O'Connor suggests that inclusive definitions of science and theology distort natural science.[3] In this dissertation the semantic complexity cannot be avoided in that the theologians being studied hold divergent views with regard to whether or not

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[1]Norman Campbell, *What Is Science*? (New York: Dover Publications, 1953); Maurice Wiles, *What Is Theology*? (New York: Oxford University Press, 1976); R. Collingwood, *The Idea of Nature* (Oxford: Clarendon Press, 1945); Edward O. Wilson, *On Human Nature* (Cambridge, MA: Harvard University Press, 1978); Alvin Plantinga, *Does God Have a Nature*? (Milwaukee: Marquette University Press, 1980).

[2]Mark Kalthoff, "God and Creation: An Historical Look at Encounters Between Christianity and Science," in *Man and Creation: Perspectives on Science and Theology* (Hillsdale, MI: Hillsdale College Press, 1993), 7.

[3]Robert C. O'Connor, "Science on Trial: Exploring the Rationality of Methodological Naturalism," *Perspectives on Science and Christian Faith* 49 (1997): 15-30.

theology is a science.[1] These theologians are further introduced in the next section.

Significance of Torrance's and Gilkey's Models

Thus far, no major study has compared or contrasted Torrance's and Gilkey's writings. However, such an investigation would make a significant contribution to the study of the use of science in theology. First, Torrance and Gilkey are theologians who are well-known for their views on this issue. Both theologians have been included in Ian Barbour's survey of contemporary theologians from various Christian traditions[2] whose writings represent different models[3] for the use of science in theology.

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[1]See chapter 2 on Torrance's theological science and chapter 3 on Gilkey's empirical theology.

[2]Barbour includes in his survey, David Tracy, Arthur Peacocke, Wolfhart Pannenberg, John Polkinghorne, George Lindbeck, Karl Rahner, Pierre Chardin, John Cobb, David Griffin, Thomas Torrance, and Langdon Gilkey. See Ian Barbour, "Surveying the Possibilities: Ways of Relating Science and Religion," in *Religion and the Natural Sciences: The Range of Engagement*, ed. James E. Huchingson (Fort Worth, TX: Harcourt Brace Jovanovich, 1993), 6-34.

[3]On the terminology of "models" the words of Holmes Rolston are instructive. "Routinely in science and religion alike an event makes sense not merely as our senses register it but as it is found to be intelligible within certain established patterns of expectation. . . . As these models become increasingly dominant, they become paradigms, and

Clearly, Torrance and Gilkey are widely recognized for their systematic study of this issue.[1]

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then we are able to give a better account of the revolutionary phases of theory overthrow" (Holmes Rolston, III, *Science and Religion: A Critical Survey* [Philadelphia: Temple University Press, 1987], 8). See also Frederick Ferré, "Mapping the Logic of Models in Science and Theology," in *New Essays in Religious Language,* ed. Dallas High (New York: Oxford University Press, 1969), 265-294; Ian Barbour, *Myths, Models, and Paradigms* (New York: Harper and Row, 1974); Wyatt Lee Woodsmall, "An Analysis of the Use of Models in Science and Religion: A Clarification of the Notion of 'Theological Model' in Response to Some Misunderstandings of This Notion on the Part of Two Writers in the Philosophy of Religion" (Ph.D. dissertation, Columbia University, 1976).

[1]Some of the following studies of Torrance and Gilkey are briefly summarized in footnotes when they are first mentioned in chapters 2 and 3. Outstanding studies of Torrance include: Alister E. McGrath, *Thomas F. Torrance: An Intellectual Biography* (Edinburgh: T & T Clark, 1999); I. John Hesselink, "The Life and Work of Professor Thomas F. Torrance," *Reformed Review* 38, no. 1 (Autumn 1984): 47; Elmer Monroe Colyer, "The Nature of Doctrine in the Theology of T. F. Torrance" (Ph.D. dissertation, Boston College, 1992), 7-8; Ronald Thiemann, *Revelation and Theology: The Gospel as Narrated Promise* (Notre Dame, IN: University of Notre Dame Press, 1985), 32; David Ford, "Review of *Reality and Scientific Theology,*" *Scottish Journal of Theology* 41 (1988): 276-280; David Atkinson, "The Theological Method of T. F. Torrance" (M.L. thesis, University of Bristol, 1973), 5; Douglas Harink, "Theology as Science: An Exposition and Evaluation of the Thought of Thomas Forsyth Torrance" (M.C.S. thesis, Regent College, 1979), 1.

Outstanding studies of Gilkey include: Kyle A. Pasewark and Jeff B. Pool, eds., *The Theology of Langdon B. Gilkey: Systematic and Critical Studies* (Macon, GA: Mercer University Press, 1999); Anne Clifford, "The Relation of Science and Religion/Theology in the Thought of Langdon Gilkey" (Ph.D. dissertation, Catholic University of America,

Second, a preliminary assessment of their writings shows that they propose conflicting models for the use of science in theology. On the one hand, Torrance defines theology in terms of the scientific character of theological method. He incorporates and goes beyond elements of Karl Barth's theological model to propose a Christological theological science which engages in dialogue with knowledge of the cosmos in other sciences.[1] On the other hand, Gilkey defines theology in terms of theological interpretation of data from natural and human sciences. He incorporates and goes beyond elements of Paul Tillich's theological model to propose a cosmological-empirical theology which interprets the facts of the cosmos as known by other sciences.[2]

1988), 1-2; Hans Küng, "Paradigm Change in Theology," in *The Whirlwind in Culture*, ed. Donald Musser and Joseph Price (Bloomington, IN: Meyer Stone, 1988), 67; Donald W. Musser, "Theological Reasoning: A Tillichean Perspective," in ibid., 106; Joseph Price, "Cosmicization and Legitimization: Religious Dimensions of Aesthetic Worlds," in ibid., 151; David Tracy, "The Question of Criteria for Inter-Religious Dialogue: A Tribute to Langdon Gilkey," in ibid., 246.

[1]Thomas Torrance, *Theological Science* (New York: Oxford University Press, 1969), 249-250. Torrance seeks to go beyond Barth's separation of theology from other legitimate sciences. Barth's neoorthodox model seems either doomed to failure or, if successful, to make theology irrelevant in a world dominated by science. See discussion of Barth in the section on The Postmodern Period below.

[2]Langdon B. Gilkey, "New Modes of Empirical Theology,"

Third, in spite of conflicts between the models of Torrance and Gilkey, they are similar in that they are post-neoorthodox theologians who are responsive to the premodern, modern, and postmodern shifts in science and theology.[1] In

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in *The Future of Empirical Theology*, ed. Bernard Meland (Chicago: University of Chicago Press, 1969), 345-370; idem, *Nature, Reality and the Sacred: The Nexus of Science and Religion* (Minneapolis, MN: Fortress Press, 1993), 75-76. Gilkey has described his effort to ground his early NeoOrthodox (quite non-Barthian) theology in common experience (after Tillich) before his "sharp" turn toward if not beyond liberalism (Langdon B. Gilkey, "Introduction: A Retrospective Glance at My Work," in *The Whirlwind in Culture: Frontiers in Theology*, ed. Donald W. Musser and Joseph L. Price (Bloomington, IN: Meyer-Stone Books, 1988), 14, 25, 29-30. See also his *Religion and the Scientific Future* (Everston, NY: Harper and Row, 1970), 20-22; *Naming the Whirlwind: The Renewal of God-Language* (Indianapolis: Bobbs-Merril, 1969), 73-80; *Reaping the Whirlwind: A Christian Interpretation of History* (New York: Seabury Press, 1976), 209-216. For the contrast with Fundamentalism and Catholicism see idem, *Naming the Whirlwind*, 73 (Clifford, 20, nn. 15, 16). See discussion of Tillich in the section on The Postmodern Period below. Gilkey also seeks to avoid linking theology so closely to the sciences that Christian particularity or distinctiveness seems compromised (*Religion and the Scientific Future*, 111-136). See discussion of Gilkey's perspective on the inevitable historical particularity of Christian myth in chapter 3 below.

[1]See previous two notes and the discussion of Torrance's and Gilkey's responsiveness to postmodernity in chapters 2 and 3. They do not designate themselves as postmodern. However, they identify their positions with the work of historians, philosophers, and theologians who may be described as postmodern or as forerunners of postmodernism. See Thomas F. Torrance, *Transformation and Convergence in the Frame of Knowledge* (Grand Rapids, MI: Eerdmans, 1984);

addition, a complementarity of their models is implied in Morrison's reference to Torrance's need for complementary Tillichean insights.[1] Torrance's and Gilkey's complementarity is also implied in Pannenberg's reference[2]

Gilkey, *Religion and the Scientific Future,* 41.

[1]Morrison writes: "It is especially Tillich's understanding of the revelatory role of historical religious symbols which would be most helpful to Torrance for they do not merely mediate the wholly separate divine but actually and rightly participate in Being Itself while not being confused with it." John Morrison, "The Self-Given Knowledge of God as He Is in the World: Thomas Forsyth Torrance's Christological-Trinitarian Assertion of Scientific Theological Realism" (Ph.D. dissertation, University of Virginia, 1993), 406-407. Morrison reports that Torrance does rarely admit to having some affinity to Idealism as necessary for truth, and that there is much of worth and interest in Tillich. However, Torrance complains that Tillich is both a monist and a dualist simultaneously and would find Tillich's thought too Hegelian and necessitarian. He would also find the "Son" and "Spirit" relegated to mere moments in the self-realization of the "Father" in contrast to his "Nicean" Trinitarianism (ibid.). See Langdon Gilkey's discussion of three types of noeorthodox apologetical argument in "Trends in Protestant Apologetics," in *The Development of Fundamental Theology, Concilium,* vol. 46, ed. Johannes B. Metz (New York: Paulist Press, 1969).

[2]According to Pannenberg, Gilkey has a "notion of providence that serves as an instrument of correction in relation to the one-sided emphases of neo-orthodox theology on christology . . . to correct the dangerous consequences of their exclusivism . . . [which] leaves the world of social and historical reality to itself." Wolfhart Pannenberg, "Providence, God, and Eschatology," in *The Whirlwind in Culture,* 171-172.

to Gilkey's complementarity with Barthian insights.[1]

Fourth, the issue of whether Torrance's and Gilkey's models need each other's complementary perspectives may also be indirectly implied in the extensive scholarly discussion of whether or not they are internally coherent. Torrance has been commended for proposing a theological science in dialogue with the sciences. However, he is also criticized, on the one hand, for linking too closely theological method and content, and, on the other hand, for neglecting non-theological scientific method.[2] Similarly Gilkey has been

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[1]On the conflict between Barth and Tillich, see Paul Tillich, "Critical and Positive Paradox: A Discussion with Karl Barth and Friedrich Gogarten," in *The Beginnings of Dialectical Theology*, ed. James M. Robinson (Richmond, VA: John Knox Press, 1962), 133-141; Karl Barth, "The Paradoxical Nature of the 'Positive Paradox': Answers and Questions to Paul Tillich," in ibid., 142-154; Paul Tillich, "Answer to Barth," in ibid., 155-158; Friedrich Gogarten, "The Intellectual Situation of the Theologian: Another Answer to Paul Tillich," in ibid., 159-162.

[2]Torrance's work is viewed as antidualistic and dualistic, dialogical and dialectical, premodern and postmodern, biblical and unbiblical, transcendent and worldly, consistent and inconsistent. Douglas Trook, "The Unified Christocentric Field: Toward a Time-Eternity Relativity Model for Theological Hermeneutics in the Onto-relational Theology of Thomas F. Torrance" (Ph.D. dissertation, Drew University, 1986); James Marcum, "Man as Priest of Creation: An Analysis and Critique of Thomas Torrance's New Synthesis Between Science and Theology" (M.A. thesis, Gordon Cornwall Seminary, 1982), 49-53; Keith Bower, "Scientific Epistemology in the Theological Method of Thomas F. Torrance" (M.A. thesis, Dallas Theological Seminary,

commended as well as criticized for the fact that he declines to critique the "facts" of science. At the same time, his empirical theology has been criticized as being limited to the dimension of transcendence apprehended by intuition.[1]

Fifth, Torrance and Gilkey presuppose the Judeo-Christian tradition of theology which springs from the

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1987), 3, 64; Thomas Langford, "T. F. Torrance's *Theological Science*: A Reaction," *Scottish Theological Journal* 25, no. 2 (1972): 155-70; Donald Klinefelter, "God and Rationality: A Critique of the Theology of Thomas F. Torrance," *The Journal of Religion* 53 (1973): 117-135; Carl Henry, *God, Revelation and Authority* (Waco, TX: Word, 1979), 3:216-224; Ronald Nash, *The Word of God and the Mind of Man* (Grand Rapids, MI: Zondervan, 1982), 95.

[1]Gilkey is also criticized as overlooking the distinction between phenomenology and fact. He is commended for identifying with Judeo-Christian Scripture and tradition. However, at the same time his work is criticized as sub-Christian. His theology is described as both consistent and inconsistent, and as profound and in need of development. Jeremy Driscoll, "Prolegomenon in the Theological Method of Langdon Gilkey" (M.A. thesis, Mount Angel Seminary, 1980), 2-6, 112-123; David Haddorff, "Langdon Gilkey's Method of Correlation: Modern Historical Experience and a Theological Interpretation of History" (M.A. thesis, Wheaton College, 1984), 9, 111-116; Chet Raymo, "God as Top Quark?" *Commonweal* 20, no. 5 (1994): 31-32; Ronnie Littlejohn, "An Analysis of Langdon Gilkey's Phenomenology of Ultimacy and Its Implications for Theology and Ethics" (Ph.D. dissertation, Baylor University, 1978); Bradford Hinze, "The Notion of Symbol and Its Usage in the Writings of Langdon Gilkey from 1959-1977" (M.A. thesis, Catholic University of America, 1978).

scriptural revelation of the Old and New Testaments. Both theologians claim biblical support of their very different models for the use of science in theology.[1] As a result, the issue of the influence of Scripture is relevant to the issue of nature of their models.[2] A biblical perspective also influences the methodology and delimitations of this dissertation which are outlined below.

Methodology

Now that the problem addressed in this dissertation has been justified, the method with which it will be studied is presented. The methodology of this study of the use of science in the writings of Torrance and Gilkey involves a fivefold description, analysis, and evaluation.[3] First, their models for the use of science in theology are investigated in terms of their responsiveness to the postmodern shift in science and theology.[4] Second, a study

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[1]See chapters 2 and 3 of this dissertation.

[2]Thomas Torrance, *Reality and Evangelical Theology: A Fresh and Challenging Approach to Christian Revelation* (Philadelphia: Westminster, 1982); Langdon Gilkey, "Cosmology, Ontology, and the Travail of Biblical Language," *The Journal of Religion* 41, no. 3 (1961): 204.

[3]See section on Delimitations below.

[4]See point 3 in the section above on the Significance

is presented of their presuppositions about the nature of science (as the study/knowledge of nature) and theology (as the study/knowledge of God).[1] Third, their proposals of specific uses of scientific method and theory in theology are examined. Fourth, they are compared and contrasted in order to discern if their models are contradictory and/or complementary. Fifth, some implications of their positions are explored with special attention given to the issue of a biblical framework for models for the use of science in theology.

After the introduction and historical background to the problem stated above[2] (chapter 1), this dissertation includes an analytical description and evaluation of models proposed by Torrance and Gilkey respectively (chapters 2 and 3), an evaluation by comparison and contrast of their models and an evaluation of their combined implications for future models (chapter 4), a summary of the dissertation with its conclusions and recommendations for further study (chapter

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of Torrance's and Gilkey's models and the discussion of premodern, modern, and postmodern periods in the section on Historical Background below.

[1]See section on Semantic Complexity above.

[2]See section on Problem and Purpose above.

5), and then, finally, a bibliography.

Delimitations

The limits of this study of the use of science in theology may be defined in three steps. First, an in-depth study of the many authors who have proposed models for the use of science in theology would illuminate some causes for their conflicting models.[1] However, such a study is beyond the scope of this dissertation. Second, with the exception of the historical background, this dissertation is limited to an analysis of Torrance's and Gilkey's models for the use of science in theology.[2] Third, while this study focuses on the responsiveness of their models to the postmodern shift in science and theology, it does not provide an extensive evaluation of their historical analysis. Fourth, with regard to their views on doctrine, this dissertation focuses on how their views on Christ (Christology), Scripture

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[1]See the "Problem Justification" above.

[2]I will describe Torrance's and Gilkey's models for the use of science in theology, or to be more precise, the models implied in their writings. In this dissertation, my references to "their views" actually refers to my interpretation of their texts. For a similar approach see Roland Spjuth, *Creation, Contingency and Divine Presence in the Theologies of Thomas F. Torrance and Eberhard Jüngel* (Lund, Sweden: Lund University Press, 1995), 8.

(Bibliology), and nature (Natural Theology) influence their models for the use of science in theology.[1] Other aspects of their writings (such as their views on use of theology in science, on other models of theology, and on doctrines) are treated only so far as to facilitate the purpose of this dissertation, which is summarized below.[2]

Summary

This first section of chapter 1 has identified the problem and purpose of this dissertation: the comparative study of Torrance's and Gilkey's models for the use of science in theology. It has also justified the problem in terms of its semantic complexity and the significance of Torrance's and Gilkey's models. Finally, it has described the methodology and delimitations of the study in terms of

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[1]Martin Hanna, "Science and Theology: Focusing the Complementary Lights of Jesus, Scripture and Nature," *Journal of the Adventist Theological Society* (*JATS*) 6, no. 2 (1995): 6-51; idem, "The Servant-Master Roles of the Laws of Jesus, Scripture, and Nature," *JATS* 9, no. 1-2 (1998-2000): 280-311; idem, "Pre-Advent Explosion of Knowledge: Scripture Authority and Plural Revelations," *Issues in Theology and Spiritual Leadership: Journal of the Department of Religion and Theology at Northern Caribbean University (ITSL)* 1, no. 1 (1999): 11-35; idem, "The Harmonious Development of Faith and Learning at Northern Caribbean University," *ITSL* 3, no. 1 (2001): 67-103.

[2]See the Problem and Purpose above.

(1) responsiveness to the postmodern shift, (2) presuppositions concerning the character of science (as study/knowledge of nature and/or divine nature) and theology (as scientific/nonscientific study/knowledge of God), (3) specific uses of science in theology, (4) possible complementarity, and (5) implications for a biblical model. These matters are addressed more thoroughly in chapters 2-4. In preparation for that investigation, the second section of this chapter surveys the historical background of the problem addressed in this dissertation.

Historical Background

The historical background to the problem of the use of science in theology by Torrance and Gilkey may be described in terms of (1) shifts in science, (2) types of Christian theology,[1] and (3) periods of the history of use of science in theology.

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[1]The distinction between shifts in science and types of theology is used here as a convenient convention. Science is often viewed as a unified discipline while theology is often viewed in terms of conflicting types. However, as this historical background will demonstrate, there have been various types of science. Also from the contemporary perspective, the history of theology may be interpreted in terms of a progressive development to which all the types of theology have contributed (see pp. 20-21).

Shifts in Science

The complex historical background to the use of the natural and human sciences in theology involves shifts in models of science as a mode of inquiry,[1] and shifts in scientific theories about reality. The former shifts have influenced how theologians model the task of theology. The latter shifts have influenced the content of theological data and doctrine.[2]

The most recent shift, which is still in process, is the shift from modernity to postmodernity. Modernity conceived of science as able to reach absolute, final, and total knowledge. However, postmodernity recognizes that science can reach only relative, limited, and provisional knowledge.[3] Consequently, the current status of the issue

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[1]Thomas S. Kuhn, *The Structure of Scientific Revolutions* (Chicago: University of Chicago Press, 1970).

[2]Hans Küng and David Tracy, eds., *Paradigm Change in Theology: A Symposium for the Future* (New York: Crossroad, 1991). See the next section on Types of Christian Theology and the discussion of use of science in chapters 2 and 3.

[3]Peter Medawar, *The Limits of Science* (New York: Oxford University Press, 1984); Stephen Toulmin, *The Return to Cosmology: Postmodern Science and the Theology of Nature* (Berkeley, CA: University of California Press, 1982); John Lukacs, *The Passing of the Modern Age* (New York: Harper and Row, 1970); Frederick Ferré, "Religious World Modeling and Postmodern Science," *Journal of Religion* 62 (1982): 261-70;

of the use of science in theology is not only unsettled but takes on new dimensions and intensity. The need for new evaluative solutions to this problem is apparent.[1]

Types of Christian Theology

The focus in this discussion of the types of theology is on various ways the use of science has been modeled in Christian theology.[2] Anne Clifford suggests that

> the principal causes of new approaches to theology among European and North American Christian theologians . . . have been an attempt to come to terms with the question of the relationship between science and religion.[3]

Such a use of science in theology is possible because

David Griffin, ed., *The Reenchantment of Science: Postmodern Proposals* (New York: State University of New York, 1988).

[1]Ian Barbour, "Science and Religion Today," in *Science and Religion, New Perspectives on the Dialogue* (New York: Harper and Row, 1968); David Lindberg and Ronald Numbers, "Beyond War and Peace: A Reapraisal of the Encounter between Christianity and Science," *Church History* 55 (1986): 338-354; John M. Mangum, *The New Faith-Science Debate: Probing Cosmology, Technology and Theology* (Minneapolis: Augsburg Fortress Press, 1989); Ted Peters, "Theology and Science: Where Are We?" *Zygon* 31, no. 2 (June 1996): 323-343; John Puddefoot, "Faith's Third Age: Theology and Science in the Third Millennium," *Colloquium* 27, no. 2 (1995): 109-120.

[2]On science and theology in Hebrew religion and Greek philosophy see Bewkes, *The Western Heritage of Faith and Reason*.

[3]Clifford, 1.

Christian theology presupposes divine-human revelation in nature.[1] However, the history of this use of science is complicated by the fact that there is no generic Christian theology.[2] For example, B. A. Gerish effectively outlines the history of Christian theology as an ongoing process of reformation (producing various models of theology) leading up to the contemporary context in which theology is done.[3]

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[1]The presupposition of revelation in nature has led to the development of different types of natural theology. The most notable example of speculative natural theology is the cosmological argument of Aquinas who argued that some truths of God are demonstrable. Anslem's natural theology regarded the idea of God as innate. His ontological argument appealed to common religious experience rather than to facts in the external world. This form of natural theology influenced the English Deists and Enlightenment men on the continent such as Lessing (David Cairns, "Natural Theology," in *A Handbook of Christian Theology* [New York: World Publishing, 1958], 249-256).

[2]Alan Padgett, "The Mutuality of Theology and Science," *Christian Scholar's Review* 26, no. 1 (1996): 22.

[3]B. A. Gerish, *Continuing the Reformation: Essays on Modern Religious Thought* (Chicago: University of Chicago Press, 1993), ix-1. Thomas A. Indinopulos describes a five step process of reformation: (1) The Protestant Reformation revised Catholicism. (2) Protestant Liberalism revised the Reformation. (3) Karl Barth initiated a dialectical NeoOrthodox recovery of the reformation emphasis on revelation while fully accepting the results of modern science. (4) Paul Tillich and others presumed that human beings have a religious nature expressed symbolically in culture through which God is known. (5) Others have developed a secular theology exclusively from the realm of humanity (*The Erosion of Faith: An Inquiry into the Origin*

Hans Küng also documents a multiplicity of contemporary models of Christian theology which have roots in the subsequent rise of Apocalyptic, Hellenistic, Medieval, Reformation, Enlightenment, and Ecumenical models.[1] The impact of the use of science on various models of theology is explored in the next section.

Historical Periods

The historical background to the issue of the use of science in theology may be divided into premodern, modern, and postmodern periods. On the one hand, the shift from the premodern to the modern period is marked by the rise of modern science in the sixteenth and seventeenth centuries. On the other hand, the shift from the modern to the post-modern period is marked by the recognition of the limits of science by many twentieth-century philosophers of science.[2] Exact dates for these shifts cannot be identified. However,

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of the Contemporary Crisis in Religious Thought [Chicago: Quadrangle Books, 1971], 209-211, 241).

[1]Hans Küng, *Christianity: Essence, History and Future* (New York: Continuum, 1996).

[2]This periodization is heuristic and is not intended to suggest the non-existence of premodern or modern models in the postmodern period. Neither does its usefulness depend on acknowledging that the postmodern attitude has become dominant in contemporary culture. See the next footnote.

according to Stephen Toulmin, the "precursors of the [postmodern] critique . . . existed at the turn of the century.[1] Similarly, for Grant Osborne, "postmodernism . . . has been developing for nearly a century. . . . Its roots go back to the turn of the [twentieth] century."[2]

The relevance of these periods to the issue of the use of science in theology is evident in that these periods have been described by David Griffin as the enchantment, the

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[1]Stephen Toulmin, foreword to *Rethinking Knowledge: Reflections Across the Disciplines,* ed. Robert Goodman and Walter Fisher (New York: State University of New York Press, 1995), x-xi. Granted, it was not until the mid-twentieth century that we "saw an avalanche of changes in the epistemological debate, particularly after 1960" (ibid.; also Willis Harmon, *Global Mind Change: The Promise of the Last Years of the Twentieth Century* [Boston: Sigo Press, 1991]). "Sometime in the 1980s these objections to modernism were recognized as the dominant cultural mood and given the name postmodernism" (Malcolm R. Brubaker, "Postmodernism and Pentecostals: A Case Study of Evangelical Hermeneutics," *Evangelical Journal* 15 [Spring 1997]: 33-45). Brubaker also surveys four basic responses of Pentecostals to postmodernism (ibid., 39-44). "The term 'postmodern' was used as early as the 1870s and 'postmodernism' first appeared in the title of a book in 1926" (Craig Bartholomew, "Post/Late? Modernity as the Context for Christian Scholarship Today," *Themelios* 22 [January 1997]: 25-37). Bartholomew gives examples of theories of the postmodern, elements of a foundational crisis, and a guide to Christian engagement with postmodernism (ibid., 25-38).

[2]Grant R. Osborne, "Christianity Challenges Postmodernism," *Evangelical Journal* 15 (Spring 1997): 1, 3.

disenchantment, and the re-enchantment of science.[1] In contrast, John Puddefoot describes them as the childhood, the adolescence, and the adulthood of theology.[2] Each period is surveyed below in terms of (1) the model of science with which it is associated, (2) representative uses of scientific models in models of theology, and (3) representative uses for scientific theory in theology.[3]

The Premodern Period

The contemporary problem of investigating Torrance's and Gilkey's models for use of science finds its roots in the premodern period. This is highlighted in James B. Miller's comment that "a full appreciation of the currently developing [postmodern] worldview requires a consideration of the premodern culture from which modernism sprang."[4]

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[1]David Griffin, "Introduction: The Reenchantment of Science," in *The Reenchantment of Science,* 1-46.

[2]Puddefoot, 109-120. These periods have also been described by James P. Martin as pre-critical, critical, and postcritical. James P. Martin, "Toward a Post-Critical Paradigm," *New Testament Studies* 33 (1987): 370-385.

[3]The sections below on the use of scientific theory in theology are based in part on David Pailin's "Natural Theology," in *Companion Encyclopedia of Theology,* ed. P. Byrne and L. Houlden (New York: Routledge, 1995), 388-98.

[4]James B. Miller, "The Emerging Postmodern World," in *Postmodern Theology,* ed. D. Allen et al. (New York: Harper

Premodern science

In the premodern period, early natural science was known as natural philosophy.[1] The term *natural philosophy* developed as early science defined itself as separate from Greek theology. This is evident in two tendencies which are represented in the work of Plato and Aristotle. Plato modeled science as knowledge in contrast to a higher wisdom. Even though lower than wisdom, Plato's conception of science was largely rationalistic and deductive. Truth was attained by rational perception of timeless transcendent reality.[2] In contrast, Aristotle distinguished between science derived from first principles and practical science. This paved the way to maturation of empirical emphasis in modern science.[3]

After the "Middle Ages" the models of Plato and Aristotle were revived in Christendom by Church scholars,

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and Row, 1989), 1.

[1]Joseph Ben-David, "The Scientific Role: The Conditions of Its Establishment in Europe," *Minerva* (1965): 15-50.

[2]Plato *Symposium* (New York: Liberal Arts Press, 1956), 204b. On the concept of timelessness see Fernando Canale, *Toward a Criticism of Theological Reason: Time and Timelessness as Primordial Presuppositions* (Berrien Springs, MI: Andrews University Press, 1987).

[3]Aristotle *Nichomean Ethics* (New York: E. Dutton, 1911), 6.6-7, 1141a, 17-20.

some of whom were major scientists such as Grosseteste and Bacon. Again, natural science was distinguished from theology. However, theology itself was defined as a science in various science-theology syntheses, the most influential of which was developed by Aquinas.[1] Premodern science was basically organic, and theology was regarded as Queen of the "organum" of science. This organic model of science maintained the theory that the cosmos was like an organism.[2]

Uses for scientific theories

The organic model of science (including theology as science) tends to support the use of theories of science as a direct source for theology.[3] However, the premodern

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[1]W. Fowler, *The Development of Scientific Method* (New York: Macmillan, 1962), 25-36; Thomas Aquinas, *Summa Theologica* (New York: Benziger, 1947), 1.1, 7.

[2]James Miller, "From Organism to Mechanism to History," in *The Church and Contemporary Cosmology*, ed. James Miller and Kenneth McCall (Pittsburgh: Carnegie Mellon University Press, 1990), 65-71. For another theological perspective on the organic model of science see Abraham Kuyper, *Principles of Sacred Theology* (Grand Rapids, MI: Eerdmans, 1954).

[3]The Eastern strand of premodern theology actually modeled the relations of God and the world as organic (Philip Sherrard, *The Eclipse of Man and Nature: An Enquiry into the Origins and Consequences of Modern Science* [West Stockbridge, MA: Lindisfarne Press, 1987], 17-43). In contrast, Western Theology modeled the transcendent world of God (*neotos*) as separated from the immanent human world

period was not marked by a monolithic perspective. Many premodern theologians limited the use of science in theology to varying degrees. The Church Father Tertullian wrote: "What indeed has Athens [natural philosophy] to do with Jerusalem [Christian theology]."[1] Anslem argued that

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(*aisthetos*) by a chasm (*chorismos*). This gap was bridged by a combination of rational natural theology grounded in nature and revealed theology received by faith (Norman R. Gulley, "The Influence of Philosophical and Scientific World Views on the Development of Theology," *Journal of the Adventist Theological Society* 4 [1993]: 137-160).

In premodern times the tendency toward conflict and/or independence of revealed truth and human discovery was bridged by natural theology (Barbour, "Surveying the Possibilities," 10). Two classic examples of the now-defunct "conflict model" interpretation of science-theology relations are: John Draper, *History of the Conflict Between Science and Religion* (New York: Appleton, 1874); and Andrew White, *A History of the Warfare of Science and Theology in Christendom* (New York: Appleton, 1896). See Colin Russell, "The Conflict Metaphor and Its Social Origins," *Science and Christian Belief* 1 (1989): 3-26.

Organic models for the use of science in theology continue to be proposed in modern and postmodern times. Such models allow for a maximum theological relevance within a particular scientific world view, but problems arise when science progresses. For example, the shift from Platonic to Aristotelian science led to some premodern science-theology separation when natural theology became a prolegomena (preparation) for revealed theology (Cairns, 249-256).

[1]Tertulian *Perscription Against Heretics* in *Sources of the Western Tradition,* ed. Marvin Perry (Boston, MA: Houghton Mifflin, 1995), 7. Tertulian represents the premodern roots of the modern and postmodern models of conflict or independence between science and theology which limit the uses of science in theology. See discussion of modern "Uses for Scientific Theories" below.

philosophy may demonstrate the implications of innate theological truths.[1] Aquinas concluded that philosophy may demonstrate revealed truths.[2] His powerful science-theology synthesis represents a highpoint of premodern views on the use of the theories of science in theology. Later Christian theologians within Aquinas's scholastic tradition limited the uses of scientific theories in theology. For Duns Scotos, philosophy can demonstrate only metaphysical truths.[3] Finally, Ockham concluded that philosophy can demonstrate only the probability of theological truths.[4]

The trend of limiting the use of theories of science in theology continued during the Protestant Reformation. For Luther, a true theologian does not look upon the invisible things of God as if they were clearly seen in visible things studied by science.[5] Calvin concluded that sin severely

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[1]Anslem of Canterbury *Basic Writings* (La Salle, IL: Open Court, 1962), 1.7, 2.7, 5.11.

[2]Thomas Aquinas *Summa Theologica*, 1.2, 3, 11-48.

[3]Johannes Duns Scotus, *A Treatise on God as First Principle* (Chicago, IL: Forum Books, 1966), 142-6.

[4]William Ockham, *Philosophical Writings* (Edinburgh: Nelson, 1957), 100, 125-26, 133.

[5]Martin Luther, "Sermons on the Gospel of St. John Chapters 1-4," *Luther's Works,* vol. 22, ed. Jaroslav Pelikan (Saint Louis, MO: Concordia Publishing House, 1957), 10-11;

limits the usefulness of the natural instinct for knowledge of God.[1] Melanchthon viewed scientific theories as complementary to theology but as subject to doubt and corruption.[2]

In spite of their limitation of the use of science in theology, premodern theologians usually presupposed the world view of premodern natural philosophy. Thus, consciously or unconsciously, they used premodern science in their theology. This may explain Luther's, Calvin's, and Melanchthon's rejection of modern Copernican science. Possibly in reaction to the new modern science, Melanchthon repaired the alliance of Protestant theology with Aristotelian science which Luther had ostensibly shattered.[3]

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idem, "Heidelberg Disputation of 1518," *Luther's Works,* vol. 31, ed. Helmut T. Lehmann, trans. Harold J. Grimm (Philadelphia: Muhlenberg Press, 1957), 40; idem, *The Table Talk or Familiar Discourse* (London: David Bogue, 1948), 2-4.

[1]John Calvin, *Institutes of the Christian Religion* (London: James Clarke, 1953), 1:1-5.

[2]Philip Melanchthon, *Corpus Reformatorum* (Halis Saxonum, apud C. A. Schwatschke et filium, 1834-60), 11:414.

[3]B. A. Gerish, "The Reformation and the Rise of Modern Science," in *The Impact of the Church Upon Its Culture--Reappraisals of the History of Christianity,* ed. Jerald C. Brauer (Chicago: University of Chicago Press, 1968), 244-245.

Models of science and theology

The use of premodern science in premodern theology is also evident in the influence of models of science on models of theology. On the one hand, Plato's model of science[1] was used in Maximus's model of theology as the supersensory knowledge of a cosmic Christ.[2] A similar influence is evident in Augustine's model of theology as a wisdom above the cosmic sciences.[3] On the other hand, Aristotle's model of science[4] was reflected in Aquinas' model of theology as a *deductive science* derived from scriptural articles of faith (*scientia dei*) and from knowledge of the cosmos (*scientia divina*).[5] The science of Aristotle is evident even in Luther's and Calvin's models of theology as a *positive or*

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[1]See section on The Premodern Period above.

[2]Maximus *Quaestiones ad Thalassium Corpus Christianorum, Series Graeca* 7 (Louvain: Brepols University Press, 1980), 40; idem, *Capitula theologica et oeconomica Maximus Con-fessor. Selected Writings*, ed. G. Berthold (New York: SPCK, 1985), 127-80.

[3]Augustine *The Trinity* (Washington, DC: Catholic University of America Press, 1963), 5.4; 13.19; 14.3; idem, *Against Julian* (New York: Fathers of the Church, 1957), 4.14, 72.

[4]See section on The Premodern Period above.

[5]Thomas Aquinas 1.1.2.

practical science of God-cosmos relations in Christ.[1]

The Modern Period

In contrast to the premodern period, the dominant contemporary conceptions of science are based on the model of science developed by modern philosophers of science. The modern model of science was radically different from the premodern model. It resulted in a revolution in the extent of the use of science in theology. Jerry Hopper comments that in the premodern period, for the most part, theology set the rules for science. In the modern period, "this situation was reversed, and the findings of science were setting the problems for philosophy which in turn was beginning to define new rules for theology."[2]

Modern science

The modern scientific method may be described as a two-step process: (1) collecting data and (2) interpreting data.

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[1]Martin Luther *Werke* (Weimar: Ausgabe, 1883), 1.153; Calvin *Institutes,* 1.1. As early as the thirteenth century, some Catholic and later some Protestant theologians viewed theology as a practical science in contrast to a pure science (Wolfhart Pannenberg, *Theology and the Philosophy of Science* [Philadelphia: Westminster Press, 1976], 228-296).

[2]Jerry Hopper, *Understanding Modern Theology: Cultural Revolutions and New Worlds* (Philadelphia: Fortress Press, 1987), 1:36.

In this process of discovery scientists formulate hypotheses or theories, conduct experiments to test theories, develop generalizations called laws, and make predictions.[1] All this assumes that scientific truth is foundational, that is, grounded in data which are indubitable or certain.[2]

In addition, modern science was defined as naturalistic since supernatural realities could not be verified by those who did not believe in or experience the supernatural. As a result, "classical" modern science has the following characteristics: parsimony/simplicity, preference for unique and complete theories, falsifiability/verifiability, empirical and non-empirical factors, subject-object

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[1]See Torrance's and Gilkey's view of the nature of science in chapters 2 and 3 below. In generally accepted definitions, "a natural science is a theoretical explanatory discipline which objectively addresses natural phenomena within the general constraints that (1) its theories must be rationally connectable to generally specifiable empirical phenomena and that (2) it normally does not leave the natural realm for the concepts employed in its explanations" (Ratzsch, 13). See also, National Academy of Scientists, *On Being a Scientist* (Washington, DC: National Academy Press, 1995); Leonard Brand, *Faith, Reason and Earth History* (Berrien Springs, MI: Andrews University Press, 1997), 1-12; Richard Bube, "The Nature of Science," in *The Encounter Between Christianity and Science*, ed. Richard Bube (Grand Rapids, MI: Eerdmans, 1968), 14-42.

[2]*See Nancey Murphy, Theology in the Age of Scientific Reasoning* (Ithaca, NY: Cornell University, 1990).

distinction, primacy of objectivity over subjectivity, tentativeness, causal-physical-objective thinking, space-time categories, minimum metaphysics, precision, formal non-dialogical logic, universality, nostalgic criteria, reasonableness/tenability, propositional truth, assumption of the intelligibility of nature, and avoidance of anthropocentricism, solipsism, mythology, idealism, and positivism.[1]

Finally, modern science is mechanical and models the cosmos as a machine. It translated the book of nature into mathematical language and reduced science to empirical-deductive principles.[2] The pioneers of modern science, such as Copernicus and Newton, presupposed harmonious relations between science and theology. However, in time, science came to be modeled as exclusive of theology.[3] Rene Descartes made a dichotomy between the phenomenal domain (cosmic machine, matter) and a noumenal domain (mind, spirit, God).[4]

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[1]Roy D. Morrison II, *Science, Theology and the Transcendental Horizon: Einstein, Kant, and Tillich* (Atlanta, GA: Scholars Press, 1994), 26-28.

[2]Miller, "From Organism to Mechanism," 71-89.

[3]Fowler, 37-54.

[4]René Descartes, *Philosophical Works* (Cambridge: Cambridge University Press, 1931).

Similarly, Immanuel Kant made a dichotomy between what is known (science) and what is believed (theology).[1]

Uses for scientific theories

Since theology and its object can hardly be viewed as mechanical, the mechanical model of science and the cosmos tends to facilitate models that cause conflict between, or independence of, science and theology. Thus many modern theologians and philosophers have negatively viewed the use of science in theology. Hume viewed science as a cause of skepticism.[2] For Kant, science contradicted theology.[3] Edwards regarded science as subversive of theology.[4] Ellis regarded science as inadequate as a ground for theology.[5]

However, other modern theologians and philosophers have viewed the use of science in theology much more favorably.

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[1]Immanuel Kant, *Critique of Pure Reason* (London: Macmillan, 1933).

[2]David Hume, *Dialogues Concerning Natural Religion* (Oxford: Clarendon Press, 1935), 282.

[3]Kant, 650.

[4]J. Edwards, *An Enquiry into Four Remarkable Texts of the New Testament* (Cambridge: W. Graves, 1692), i.

[5]J. Ellis, *Some Brief Considerations upon Mr. Locke's Hypothesis* (London: J. Watts, 1743), 32.

Locke viewed science as an adequate ground for theology.[1] More specifically, Descartes viewed science as a support for innate knowledge of God.[2] On the one hand, Clarke viewed science as an *a priori* support for theology.[3] On the other hand, Paley viewed science as an *a posteriori* support.[4]

Models of science and theology

The use of the modern model of science in modern models of theology has been pervasive at both ends of the liberal-conservative spectrum of theology. There was use of modern science in Schleiermacher's Enlightenment/Liberal Model of theology as a *positive/practical* science of religious experience reflected in Christ and Scripture.[5] Conservative theology rejected the use of science in Liberal Theology.[6]

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[1]John Locke, *An Essay in Human Understanding* (Oxford: Clarendon Press, 1979), 619-21, 688-706.

[2]Descartes, 1:169, 224-28.

[3]Samuel Clarke, *A Discourse Concerning the Being and Attributes of God* (London: Botham, 1732), 8-50.

[4]William Paley, *Natural Theology*, 12th ed. (Charlottesville, VA: Ibis, 1802), 3, 40.

[5]Freidrich Schleiermacher, *On the Glaubenslehre* (Atlanta, GA: Scholar's Press, 1981), 60-68.

[6]Conservatives use a modern historical-grammatical method influenced by science to verify Scripture's reference

However, there was also a use of modern science in Hodge's Conservative Model of theology as an *inductive science* of Scripture illuminating Christ and the cosmos.[1] The use of science in Liberal Theology was influenced by an emphasis on the immanence of God. The use of science in Conservative Theology was influenced by an effort by conservatives to renew the premodern emphasis on transcendence.[2]

The Postmodern Period

No study of the historical background to contemporary use of science in theology is complete without a survey of developments during the postmodern period. A growing number of scientists, philosophers, and theologians regard twentieth-century science as radically new.[3] Others

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to revelatory events. Liberals use a more radical modern historical-critical method to expose differences between Scripture and a modern reconstruction of the essential core of revelatory events (Gerald Sheppard, *The Future of the Bible: Beyond Liberalism and Literalism* [Toronto, Ontario, Canada: United Church Publishing House, 1990], 11).

[1]Charles Hodge, *Systematic Theology* (New York: Scribners, 1872-3), 1-19.

[2]Jerry H. Gill, *Mediated Transcendence: A Postmodern Reflection* (Macon, GA: Mercer University Press, 1989).

[3]Christopher Mooney writes: "A new science has emerged that challenges traditional science" ("Theology and Science: A New Commitment to Dialogue," *Theological Studies* 52

emphasize the continuity of modern science with twentieth century science. Nevertheless, what is clear is that models of science and of the use of science in theology have undergone significant change.[1] In addition, contemporary theologians often seek to overcome the imbalances of the premodern and modern emphases on divine transcendence and immanence respectively by recognizing divine-human revelation as the mediation of divine transcendence.[2]

[1991]: 320). See also physicist Heinz Pagel, *The Dreams of Reason* (New York: Bantam, 1989), 12, 329. James Miller goes so far as to write: "Most observers of contemporary history acknowledge that western civilization is undergoing a fundamental shift in worldview. In addition, it is generally agreed that this shift has been spurred on by the discoveries and theoretical developments which have occurred in the natural sciences over the past 150 or so years" ("The Emerging Postmodern World," 1).

[1]"[A] revolution is being led by an unprecedented and astonishing intellectual trend, namely the reasking of the God-question within the orbit of scientific discussion about the natural world" (Peters, "Theology and Science: Where Are We?" 324). See also Stanley Grenz and Roger Olson, *20th Century Theology: God and the World in a Transitional Age* (Downers Grove, IL: InterVarsity Press, 1992).

[2]Gill, *Mediated Transcendence*.

Postmodern science[1]

In the postmodern period, discoveries by scientists (such as Planck, Einstein, Heisenberg, and Böhm) are displacing the modern matter/spirit, knowledge/belief, and science/theology dualisms. Various other aspects of the postmodern model of science have been outlined by philosophers. For Popper, science is grounded in nonlogical creative imagination. Kuhn points out that science makes fundamental progress by radical transformations of worldviews. Toulmin regards science as an ecological process. For Polanyi, science is personal, committed, and communitarian. Whitehead concludes that science leads to a worldview of dynamic historical temporality.[2]

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[1]By the term postmodern science I intend to identify the new ideas about science that have arisen during the postmodern period. This does not imply that most scientists or philosophers have accepted that a postmodern science has displaced modern science. As indicated in the previous section many view the new developments as innovations within modern science.

[2]Miller, "The Emerging Postmodern World," 1-19. "Postmodern science has certainly been making headlines all over the country" (J. Wentzel van Huyssteen, "Should We Be Trying So Hard to Be Postmodern? A Response to Drees, Haught, and Yeager," *Zygon* 32 (December 1997): 567). "*Postmodern science* . . . finds its best expression in postpositivist, historicist, and even post-Kantian philosophy of science and has revealed the theory ladenness of all data, the underdetermination of scientific theories by fact, and the shaping role of epistemic values . . . and

Postmodern science, sometimes designated as "neo-classical" modern science,[1] uses the same processes of data collection and interpretation as does "classical" modern science. However, postmodern thought recognizes that the present system of specialized sciences includes different and often contradictory assumptions, methods and results; and has not yet produced a completely ordered theoretical world view.[2] In addition, postmodern science does not seek indubitable or certain foundations for its truth. Some have suggested that postmodern scientific truth contributes to,

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nonepistemic value-judgments . . . in the scientific process" (ibid., 569-570). The idea of postmodern science is also supported by philosophical analysis of the work of contemporary scientists, many of whom do not view themselves as postmodern (Toulmin, *Return to Cosmology*, 89-213). See also L. Wittgenstein, *Philosophical Investigations* (New York: Macmillan, 1953); Alasdair McIntyre, *Whose Justice? Which Rationality*? (South Bend, IN: University of Notre Dame Press, 1988).

[1]This terminology reflects the fact that many who recognize the radical changes in science do not percieve this to be an indication of the existence of a postmodern science. See Toulmin's comment in the previous footnote.

[2]Bengt Gustafsson, "The Current Scientific World View," in *The New Faith-Science Debate: Probing Cosmology, Technology and Theology*, ed. John M. Mangum (Minneapolis: Fortress Press, 1989), 1. Some have suggested that in the postmodern period various aspects of modernism come together. See Michael W. Messmer, "Making Sense of/with Postmodernism," *Soundings* 69 (Fall 1985): 418-20; van Huyssteen, 569, 572, 580-584.

and is at the same time supported by, a "web" of beliefs.[1]

Postmodern science differs from "classical" modern science in that it (1) assumes the existence of a nonmaterial or non-physical reality; (2) assumes absence of universal causal sub-atomic relations; (3) observes sub-atomic events rather than theorizing what happens between events; (4) assumes unity or continuity between subject and object; (5) does not regard non-contradiction as universal or absolute; (6) avoids materialistic ontology or metaphysics; and (7) seeks to discover ultimate cosmic order by some form of idealism.[2] Postmodern science, even more than modern science, has been historicized.[3] Thus postmodern science tends to model the cosmos as a history.[4]

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[1]See Nancey Murphy, *Anglo-American Postmodernity: Philosophical Perspectives on Science, Religion, and Ethics* (Boulder, CO: Westview Press, 1997).

[2]Roy Morrison, 30-31.

[3]Stephen Toulmin, "The Historicization of Natural Science: Its Implications for Theology," in *Paradigm Change in Theology*, 233-241; John T. Baldwin, "Historicization and Christian Theological Method," *Journal of the Adventist Theological Society* 4, no. 2 (1993): 168-169.

[4]Miller, "From Organism to Mechanism to History," 89-125.

Uses for scientific theories

The historicization of science involves recognition of what Rorty refers to as the limitations of science.[1] Neo-classical modern and postmodern[2] theologians and philosophers[3] view the theological use of this limited science in different ways. Some like Russell view science

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[1]Richard Rorty, *Objectivity, Relativism, and Truth* (Cambridge: Cambridge University Press, 1991), 1:218.

[2]The modern-postmodern distinction is ambiguous because some persons who are categorized as postmodern are also categorized as hyper-modern (Albert Borgmann, *Crossing the Postmodern Divide* [Chicago, IL: University of Chicago Press, 1992], 78-102). Also, contemporary theologians, who do not claim to be postmodern, need to demonstrate relevance to "our putatively postmodern time" (William C. Placher, *The Domestication of Transcendence: How Modern Thinking About God Went Wrong* [Louisville, KY: Westminster John Knox Press, 1996], 7). "Today the postmodern impulse is emerging among all disciplines and in various cultural forms" (Robertson Mcquilkin and Bradford Mullen, "The Impact of Postmodern Thinking on Evangelical Hermeneutics," *Journal of the Evangelical Theological Society* 40 [1997]: 76-82). Some have concluded that "any hermeneutic which cannot account for its loci of meanings within that postmodern paradigm will become nonsensical and irrelevant" (Timothy B. Cargal, "Beyond the Fundamentalist-Modernist Controversy: Pentecostals and Hermeneutics in a Postmodern Age," *Pneuma* 15 [1993]: 163-188).

[3]There are a great variety of postmodern theologies including (1) constructive (or revisionary), (2) deconstructive (or eliminative), (3) liberationist, and (4) restorationist (or conservative). See David Griffin's "Introduction," in *Varieties of Postmodern Theology*, ed. David Griffin, William Beardslee, and Joe Holland (Albany, NY: State University of New York Press, 1989), 3.

as unable to support theology.[1] Others, like Kierkegaard, regard science and theology as incongruent.[2] Still others view the use of science in theology more positively. Barbour views science as a basis for new forms of natural theology.[3] Hartshorne uses science as a basis for a new theism.[4] Lindbeck suggests that the limits of science facilitate making theology credible on its own terms.[5] Finally, Pailin concludes that theology may be shown to be credible by its harmony with, or proposal of, insights on reality which are compatible with insights from science.[6]

Models of science and theology

At the present time, theology is largely characterized by pluralism and manifests an apparent disarray. There are

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[1]Bertrand Russell, *Why I Am Not a Christian and Other Essays* (London: Allen & Unwin, 1975), 140-41.

[2]Soren Kierkegaard, *Philosophical Fragments* (Princeton, NJ: Princeton University Press, 1936), 34-5.

[3]Ian Barbour, *Religion in an Age of Science* (San Francisco, CA: Harper, 1990), 1: 135-136.

[4]Charles Hartshorne, *Man's Vision of God and the Logic of Theism* (Hamden, CT: Archon Books, 1964), 342-52.

[5]George Lindbeck, *The Nature of Doctrine* (Philadelphia: Westminster Press, 1984), 47-52, 129-131.

[6]Pailin, 407.

no commanding theologians or systems of theology that elicit wide support, and no general agreement even as to what theology is.[1] However, in this context, some avant-garde theologians either consciously or unconsciously use the recent postmodern model of science for the building of constructive postmodern[2] models of theology.

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[1]Robert H. King, "Introduction: The Task of theology," in *Christian Theology: An Introduction to Its Traditions and Tasks*, ed. Peter Hodgson and Robert King (Philadelphia: Fortress Press, 1985), 1. Compare the state of science described in section above on Postmodern Science.

[2]The term postmodernism commonly designates deconstructive trends. However, there are constructive postmodern trends, some of which predate Deconstructive Postmodernism. The constructive and deconstructive trends in postmodernism are also described as rational and antirational, or affirmative and skeptical. David Griffin and his collaborators (John Cobb, Marcus Ford, Pete Gunter, Peter Ochs) regard Charles Pierce (1839-1914), William James (1842-1910), Henri Bergson (1859-1941), Alfred Whitehead (1861-1947), and Charles Hartshorne (1897-) as founders of Constructive Postmodern philosophy. Deconstructive Postmodernism developed from the work of such philosophers as Wittgenstein, Heidegger, and Derrida (David Griffin, "Introduction to SUNY Series in Constructive Postmodern Thought," in *Founders of Constructive Postmodern Philosophy*, ed. David Griffin et al. [Albany, NY: State University of New York Press, 1993], vii-x). See van Huyssteen, 569-571.

"Deconstructive or eliminative postmodernism . . . overcomes the modern worldview through an antiworldview: it deconstructs or eliminates the ingredients necessary for a worldview, such as God, self, purpose, meaning, a real world, and truth as correspondence [to reality]. . . . [This] issues in relativism, even nihilism. It could also be called ultramodernism, in that its eliminations result from carrying modern premises to their logical conclusions. . . .

The inception of this constructive postmodern trend in theology is evident in the writings of Karl Barth and Paul Tillich who[1] have contributed to the postmodern revolution in theology.[2] On the one hand, Barth's contribution is

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By contrast . . . constructive or revisionary [Postmodernism] . . . seeks to overcome the modern worldview not by eliminating the possibility of worldviews as such, but by constructing a postmodern worldview through a revision of modern premises and traditional [premodern] concepts. This . . . involves a new unity of scientific, ethical, aesthetic, and religious intuitions. It rejects not science as such but only that scientism in which the data of the modern natural sciences are alone allowed to contribute to the construction of our worldview" (ibid., viii).

[1]Nels Ferré comments: "Barth has done the Christian cause a great service . . . by pressing the claims for message and method together." However, Tillich has done an equal service by "decrying the arbitrariness and irrelevance of Barth's [model which is] . . . informed by total transcendence and worked out in terms of sheer ontological discontinuity of God and man without some mediating category" (Nels Ferré, "Contemporary Theology in the Light of 100 Years," *Theology Today* 15, no. 3 [1958]: 374). After the first world war, the optimism of the modern scientific culture began to collapse and NeoOrthodoxy sought to locate the sources of theology outside of science. In spite of its rejection of premodern and modern models for the use of science in theology, NeoOrthodoxy held science as authoritative for the study of non-divine nature. See Langdon Gilkey, "Neo-Orthodoxy," in *A Handbook of Christian Theology*, 256-261; John Cobb, "From Crisis Theology to the Postmodern World," *Centennial Review* 8 (1964): 209-220. On the relationships of Barth and Tillich to Torrance and Gilkey, see the Problem Justification above.

[2]John Dillenberger, *Protestant Thought and Natural Science: A Historical Interpretation* (Garden City, NY:

high-lighted in the subtitle of a book written by William Stacy Johnson: *Karl Barth and the Postmodern Foundations of Theology.*[1] Similarly, Hans Küng refers to Barth as one who is an "*initiator* of . . . a *'postmodern' paradigm in theology.*"[2] On the other hand, Robert Scharlemann comments that Tillich "may have been the first to lay hold of and to make visible the problem that appears later in the postmodern discussion of [first] principles."[3]

The use of postmodern science is not obviously evident in Barth who defines theology as being independent from all the other sciences. Nevertheless, his Neoorthodox model of theology as a *positive/objective science* of God shows some

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Doubleday, 1960), 16.

[1]William Stacy Johnson, *The Mystery of God: Karl Barth and the Postmodern Foundations of Theology* (Louisville, KY: Westminster John Knox Press, 1997).

[2]Hans Küng, "Karl Barth and the Postmodern Paradigm," *The Princeton Seminary Bulletin* 9 (1998): 19. Barth is also described as "the harshest critic of that enlightened-modern paradigm" (ibid., 20). For Küng, Barth did not perfect a postmodern paradigm which needs to face the challenge of natural theology and the creation-revelation relation (ibid., 25-27).

[3]Robert P. Scharlemann, Introduction to *Theology at the End of the Century: A Dialogue on the Postmodern,* ed. Robert P. Scharlemann (Charlottesville, VA: The University Press of Virginia, 1990), 6. Scharlemann also provides a description of postmodern thought on pp. 1-7.

evidence of the use of science.[1] Tillich's Neoliberal model of theology as a *theonomous science* of God (which is correlated with all the other sciences) makes the use of postmodern science more explicit.[2] As indicated earlier in

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[1]Karl Barth, *Church Dogmatics* (Edinburgh: T & T Clark 1936-69), 1:1-8. Later Barth acknowledged a limited use for sciences in theology in his book: *The Humanity of God* (Richmond, VA: John Knox Press, 1960). Not everyone agrees that there is a significant difference between early and late Barth (Cornelius Van Til, *The New Modernism* [London: James Clarke, 1946]; idem, *Christianity and Barthianism* [Grand Rapids, MI: Baker, 1962]). However, Torrance argues that there is a discontinuity between early and late Barth (Thomas Torrance, "The New Modernism," *The Evangelical Quarterly* 19 [1947]: 144-149). The dialogue model for the use of science in theology rejects the direct use of science as a theological source but cannot avoid the influence of science. This model seeks to balance scientific relevance with theological independence. According to Holmes Rolston, Barth's transscientific theism is a dialogical theology which adventures beyond science in theological explanation (Rolston, 322-335).

[2]Paul Tillich, *The System of the Sciences* (East Brunswick, NJ: Associated University Press, 1981), 206-10. The integration model for the use of science in theology, like the organic model, allows for direct transfer from science to theology. However, the use of science is always open-ended and provisional since both science and theology are regarded as part of a process of evolutionary change. According to Rolston, Tillich's Scientific-Existentialist Theism is an integration theology which teaches the complementarity of nature and God. However, the realm of the supernatural is an existential inner core of spirit, religion, and meaning beyond causality, nature, history, culture, and science. This model is scientific as well as spiritual but is unclear about the intersection of the two realms (Rolston, 306-315). Langdon Gilkey refers to the dialectical communication of divine presence ("Symbols,

the section on problem justification, the models proposed by Barth and Tillich represent key turning points in the history of the use of science in theology. They illuminate the historical place of the proposals of Thomas Torrance and Langdon Gilkey which are investigated in this dissertation.

Summary

The premodern, modern, and postmodern periods of the history of science involve shifts in the way science is modeled. These models may be summarized in terms of premodern science or natural philosophy, modern "classical" science, and postmodern science or "neo-classical" modern science.[1] The premodern, modern, and postmodern shifts may be described as follows. First, a union of deduction and induction, and a separation of natural science and theology began to develop during the premodern period. Second, this led to the development of naturalistic science during the modern period. Third, however, in the postmodern period the modern matter/spirit, knowledge/belief, and science/theology

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Meaning, and the Divine Presence," *Theological Studies* 35, no 2 (1974): 249, 260.

[1]An extensive typology of premodern, modern, and post-modern paradigms in science and theology is presented by James P. Martin in "Toward a Post-Critical Paradigm," 370-385.

dualisms are being progressively displaced.

Some of the proposed uses for science in theology have been aptly summarized by William Austin. He suggests that the use of science in theology may be direct, when science competes with, confirms, and/or contradicts theology; or indirect, when science provides insights, metaphysics, and/or methods for theology.[1] The historical background presented above suggests an additional option. The use of science in theology may also be complex, when science has both direct and indirect uses in theology.[2]

The use of models of science in models of theology is evident in the fact that the scientific nature of theology has been described in terms of premodern, modern, and postmodern models of the methodology of natural science.

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[1]William Austin, *The Relevance of Natural Science to Theology* (New York: Macmillan, 1976), 6-8.

[2]Hanna, "Science and Theology," 7. Nine potential uses for science in theology are outlined by William Drees. These uses result from a combination of elements from the side of science, as based on relations between the facts of nature, ideas on the nature of knowledge, and models of the nature of the entire cosmos; and from the side of theology, as based on relations between cognitive claims, religious experiences, and religious traditions (William Drees, *Religion, Science and Naturalism* [Cambridge: Cambridge University Press, 1996], 39-53; idem, "Postmodernism and the Dialogue between Religion and Science," *Zygon* 32 [December 1997]: 525-542).

These include models of theology as supersensory knowledge, wisdom, deductive or derived science, positive or practical science, theological science, and theonomous science.

This survey of the history of the use of science in theology has focused on issues of ontology and epistemology. Ontology has to do with the object of science (nature), and the object of theology (God). Epistemology has to do with the nature of knowledge in science and theology. Premodern models of theology addressed these issues in terms of supersensory knowledge of the transcendent (Maximus), deduction from the revelation of the transcendent in Scripture and cosmos (Aquinas), and scientific study of mediated God-cosmos relations in Christ (Luther, Calvin). The major modern options in theology were the study of religious experience as reflected in Christ and Scripture (Liberal Theology) or the study of the illumination of Christ and the cosmos by Scripture (Conservative Theology).

Postmodern options include the study of Christ, Scripture, and nature through theological science as distinct from other sciences (Barth) or through the correlation of theology and other sciences (Tillich). These models of theology as science are the historical precedents to Torrance's and Gilkey's models for the use of science in

theological science and in empirical theology respectively.[1] Torrance's and Gilkey's models are further described and evaluated in chapters 2, 3, and 4 of this dissertation.

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[1]See introduction of these models in the section above on the Significance of Torrance's and Gilkey's Models.

CHAPTER II

THE USE OF SCIENCE IN THOMAS F. TORRANCE'S THEOLOGICAL SCIENCE

Chapter 1 of this dissertation introduced the problem of the use of science in theology in the writings of Thomas F. Torrance and Langdon B. Gilkey. This introduction was followed by the presentation of the premodern, modern, and postmodern historical background to the problem. This chapter presents an analytical description and partial evaluation[1] of Torrance's model.

Introduction

The study of Torrance's model may be introduced by addressing the following questions. Who is Thomas Torrance? Does he propose a model for the use of science in theology?

Who Is Thomas Torrance?

Torrance was born to missionary parents in China in 1913. He attained an M.A. in 1934 and a B.D. in 1937 at the University of Edinburgh, a D.Th. in 1946 under Karl Barth's

[1]Further evaluation by comparison and contrast with the model proposed by Langdon Gilkey is pursued in chapter 4.

guidance at the University of Basel, and a D.Litt. in 1970 at the University of Edinburgh. He taught theology at Auburn Seminary, New York, from 1938-1939 and served as chaplain in the British forces from 1943-1945. In 1949 he was ordained and served as pastor in the Church of Scotland until 1950 when he was appointed a chair in Church History at Edinburgh. From 1952-1979 he served as Professor of Christian Dogmatics. He was Hewett Lecturer at the Norton Center and Cambridge in 1959 and served as Moderator of the Church of Scotland from 1976-1977. He also founded the *Scottish Journal of Theology* and the Scottish Church Theological Society, and served for ten years on the Faith and Order Commission for the World Council of Churches.[1]

Torrance is an outstanding and prolific[2] theologian whose contribution to contemporary theology is indicated by numerous awards[3] and by the assessments of his peers. He

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[1]Roland Spjuth, 27; Hal May and James G. Lesniak, eds., *Contemporary Authors* (Detroit, MI: Gale Research Co., 1990), 29:426-427; Hesselink, 47.

[2]Ian R. Torrance, "A Bibliography of the Writings of T. F. Torrance 1941-1989," *Scottish Journal of Theology* 43, no. 2 (1990): 225-262.

[3]Hesselink, 47; Colyer, 7. Awards include: Order of British Empire, 1945; D.D. Presbyterian College, Montreal, 1950; St. Andrews University, 1960; D. Theol., Universities of Paris, 1959, Geneva, 1959, Oslo, 1961, Theological Academy of the Reformed Church, Hungary, 1988; Cross of St. Mark, 1970; Collins Biennial Religious Book Award, 1970; Templeton Prize, 1978; Fellow, Royal Society of Edinburgh, 1979 and the British Academy, 1982; D.Sc., Heriot-Watt

has been described as the "leading"[1] or the "greatest"[2] British theologian of the latter part of the twentieth century; "the leading Reformed theologian today in the Anglo-Saxon world"; a leading mind in theological thought;[3] and as "one of the most brilliant and seminal thinkers of our time."[4]

Does Torrance Propose a Model for the Use of Science in Theology?

Torrance's peers have commented on his theology in a way that indirectly indicates that he has proposed a model for the use of science in theology. Douglas Harink comments that one would have to search far for another theologian who

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University, Edingburgh, 1983 (Hal May and James G. Lesniak, eds. *Contemporary Authors*, [Detroit, MI: Gale Research, 1990], 29:426).

[1]John Douglas Morrison, i. Morrison describes Torrance's theology as Christ-centered, Trinitarian, critical, realist, objective in epistemology, analogous with scientific thinking (following Maxwell, Einstein, and Polanyi), and unconsciously dualist.

[2]Robert Julian Stamps, "The Sacrament of the Word Made Flesh: The Eucharistic Theology of Thomas F. Torrance" (Ph.D. diss., St. John's College, University of Nottingham, 1986), ii.

[3]Harink, 1. Harink discusses Torrance's views on: Barth; overcoming dualism; epistemology; the new physics; doctrine; natural theology; theological purity; ecumenism; and rational apologetics.

[4]Bower, 1. For Douglas Trook, implications of Torrance's views are revolutionary, under-developed, and ignored (4-5).

is as conversant as Torrance with the entire theological tradition and who has covered in his writings such a vast range of modern theology and science.[1] According to John Macquarie, Torrance is a leading representative of the Calvinist and Barthian traditions who provides a new dimension to those traditions by stressing the scientific and objective character of theology.[2] For David Ford, Torrance "most thoroughly: comes to terms with the natural sciences in a way that shows up a shameful gap in the vast majority of contemporary theologies."[3] Similarly, according to David Atkinson, Torrance makes an "immense contribution . . . at the formal level of scientific theological procedure."[4] Elmer Colyer agrees that Torrance is "a major

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[1]Harink, 1.

[2]John Macquarie, *Twentieth Century Religious Thought* (Philadelphia: Trinity Press International, 1989), 401. In conjunction with concern with science Torrance has held to ecumenical creeds and has mediated to the English-speaking world the great German theologian Karl Barth (Harink, 1; see Thomas Torrance's "Ecumenism and Science," in *God and Rationality* [New York: Oxford University Press, 1971], 112-134; idem, *Karl Barth, Biblical and Evangelical Theologian* [Edinburgh: T&T Clark, 1990]). See also Richard Albert Mohler, "Evangelical Theology and Karl Barth: Representative Models of Response" (Ph.D. diss., Southern Baptist Theological Seminary, 1989).

[3]Ford, 276-280.

[4]Atkinson, 5. Atkinson expounds Torrance's views on: Christocentric meta-science; a subjective cultural split; Christian knowledge of God; revelation as primary datum for scientific theology; theology's slowness to learn from science; rationality and faith; Incarnation, Scripture,

figure in contemporary theology who has made significant contribution . . . [in a] scientific context."[1]

That Torrance proposes a model for the use of science in theology is directly indicated in his own words. First, he expresses the "intention . . . to clarify the processes of scientific activity [method] in theology."[2] Second, he argues that "scientific understanding [theory/fact] . . . must be taken into account" in theology.[3] While he has emphasized different aspects of theology during his career, Torrance's model for the use of science in theology has been developed in an amazingly harmonious way in his writings.[4]

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history, hermeneutics, and doctrine; truth as Personal Being; reconstruction in theology; the Object in Dogmatics; and ecumenical relevance.

[1]Colyer, 8.

[2]Thomas F. Torrance, *Theological Science* (London: Oxford University Press, 1978). xvii. In order to avoid repetition, after the first citation of works by Thomas F. Torrance subsequent citations will mention only the titles.

[3]Torrance, *Reality and Evangelical Theology,* 11. There are "several positive aspects in recent scientific change which may affect Christian theology beneficially" (idem, *Christian Theology and Scientific Culture,* vol. 1 of *Theology and Scientific Culture*, ed. T. F. Torrance [New York: Oxford University Press, 1981], 27). The "patterns disclosed by scientific research in the space-time universe . . . constitut[e] . . . a 'created correspondence' (Karl Barth's expression) to the uncreated rationality of God himself" (idem, *The Christian Frame of Mind* [Edinburgh: The Handsel Press, 1985], 28). Therefore, scientific cosmology must be "thought carefully" into eschatology (ibid., 63).

[4]In the 1950s he saw that ecumenism needs a universal, objective method (C. B. Kruger, "The Doctrine of the

In summary, Torrance and his model for the use of science in theology have now been introduced by a brief survey of his biography, some assessments by his peers, and his own words. The next section of this chapter describes how Torrance situates his model in terms of the history of science and its use in theology.

Responsiveness to the Postmodern Shift

Is Torrance's model for the use of science in theology responsive to the postmodern shift in science and in its use in theology? As indicated in chapter 1, responsiveness to the postmodern shift would show that Torrance's model is very relevant to the contemporary situation in theology.[1]

Torrance does not describe his model for the use of science in theology as postmodern. However, he presents his model against the historical background of the recent shift in science and in its use in theology. This shift was designated in chapter 1 of this dissertation as postmodern. Torrance's responsiveness to this shift is presented below in terms of his description of the history of the shift

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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). On the diversity yet consistency of his career see Hesselink, "The Life and Work of Professor Thomas F. Torrance."

[1]See Methodology and The Postmodern Period, chapter 1.

beyond "classical modern science" and its use in theology.[1]

The History of Science

Torrance's discussion of a postmodern shift in science may be organized in terms of: (1) three periods/shifts in the history of science, (2) the radical nature of the third shift, (3) new conceptions of objectivity and subjectivity, and (4) the shift from dualistic to unitary thinking.

Historical Periods/Shifts

Responsiveness to the postmodern shift is implicit in Torrance's fourfold division of the history of science. In this connection he describes three shifts in the history of scientific cosmology. These were the shifts from the primitive Greek cosmology to a Ptolemaic cosmology (2nd - 4th centuries), from the Ptolemaic to a Copernican and Newtonian

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[1]He discusses "stages in . . . modern science" (Thomas F. Torrance, *Transformation and Convergence in the Frame of Knowledge: Explorations in the Interrelations of Scientific and Theological Enterprise* [Grand Rapids, MI: Eerdmans, 1984], 279; hereafter cited as *Transformation and Convergence*) and rejects aspects of the "classical" stage of modern science and the modern forms of theology that accommodate to it (*Theological Science*, 75, 300-301). He refers to a premodern classical or objective approach to knowledge and a modern constructivist approach (*Reality and Scientific Theology* (Edinburgh: Scottish Academic Press, 1985], xiii, 12). He unites aspects of premodern "classical" Christianity and science with aspects of modern theology and science (*The Ground and Grammar of Theology* [Charlottesville: University Press of America, 1980], 44-45); hereafter cited as *Ground and Grammar*.

cosmology (16th - 17th centuries), and from the Newtonian cosmology to the Einsteinian cosmology (20th century).[1]

There is a special significance to the last two shifts which Torrance describes respectively as (1) "the great transition" to modern times, and (2) "the change in which the frontiers of human thought are being pushed back."[2] He argues that we are still experiencing the latest shift and compares it to the sixteenth century Copernican revolution.[3]

For Torrance, the maturation of this shift in science

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[1]Thomas F. Torrance, *Theology in Reconciliation* (London: Geoffrey Chapman, 1975), 267-293; *Theology in Reconstruction* (London: SCM, 1965), 62-78, 259-283; *Reality and Scientific Theology,* 1-31, 80; *Transformation and Convergence,* 243-250; *God and Rationality,* 29-31. See Colin Weightman, *Theology in a Polanyian Universe: The Theology of Thomas Torrance* (New York: Peter Lang, 1994), 182. For Trook, Torrance's Einsteinian/ hypothetical-deductive method has three stages: Pre-Scientific, Scientific, and Meta-Scientific (Trook, 43-48). For Neidhardt, Torrance shares key themes with Einstein's science (W. Neidhardt, "Key Themes in Thomas F. Torrance's Integration of Judeo-Christian Theology and Natural Science," in *The Christian Frame of Mind,* ed. Thomas Torrance [Colorado Springs: Helmers and Howard, 1989], xv, xxxiv-xxxv).

[2]*God and Rationality,* 99.

[3]*Transformation and Convergence,* 243-244. See "Christian Theology in the Context of Scientific Change" (ibid.). Bower surveys Torrance's evangelizing of the scientific culture (Bower, 3, 59-64). See also the section on A Dialogical Model for the Use of Science. On Torrance's epistemology see Robert Keith Martin, "The Incarnate Ground of Christian Education: The Integration of Epistemology and Ontology in the Thought of Michael Polanyi and Thomas F. Torrance" (Ph.D. diss., Princeton Theological Seminary, 1995).

is a twentieth century phenomenon which began in the nineteenth century with Faraday, Maxwell, Gauss, Lobachewski, Riemann, and Minkowski. However, "it was of course only with quantum theory and relativity theory [in the 20th century] that the gigantic revolution in science really began to set in."[1] This revolution has radical implications for "fundamental epistemology, affecting every area of human knowledge."[2] Torrance's view of the radical and continuing nature of this postmodern shift in science is further explored below.

A Radical/Continuing Shift

Torrance describes the current shift in science as a shift to a "new science"[3] involving "a radical change in the whole structure of scientific consciousness."[4] The post-modern nature of this change is evident in his reference to a "giving way," "revolution," "collapse," "crash," "over

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[1]*Transformation and Convergence,* 66. Torrance discusses the significance of the 1960s in the most recent shift (*Ground and Grammar,* 20).

[2]*Transformation and Convergence,* 244. "Einstein initiated changes that have been transforming the whole perspective of modern science, but only now, more than 70 years later, are we coming to terms with the implications of these changes" (ibid., 244).

[3]*Ibid.,* 87.

[4]*Theological Science,* 91.

turning," "shattering," "dethronement," "advancing beyond," "breaking through," and "fall" of the modern paradigm.[1]

Nevertheless, for Torrance, this radical change is still in progress. The present state of science is one of revolutionary change, as he perceives is indicated in the work of Thomas Kuhn.[2] "The whole concept of science itself is in [a] process of change" which Torrance calls "a profound revision of the first principles of science" beyond pre-modern "Greek (including mediaeval) science and [beyond] modern science."[3] Some issues involved in this radical and ongoing shift are presented in subsequent sections.

Objectivity-Subjectivity

A renewed and transformed emphasis on objectivity is central to the most recent developments which have taken

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[1]*Transformation and Convergence,* 247-248.

[2]However, for Torrance, "a revolutionary change of this kind is probably not such a sudden or unstructured event as Kuhn would like to make out" (ibid., 243). Torrance points out that many scientists admit that the way they formulate concepts of scientific method do not correspond to way in which they make scientific discoveries. They admit to an anomaly between their heuristic advances in knowledge of the universe and their paradigmatic framework and the rules abstracted from them (ibid., 244-245; also *Reality and Scientific Theology,* 76-77). "There is still a serious gap between what has been taking place in the foundations of pure science and the principles of knowledge with which we operate elsewhere, especially in the human and social sciences" (*Transformation and Convergence,* 244).

[3]*Transformation and Convergence,* 61-62.

place in science.[1] For Torrance, the recent shift involves a "change in the nature and depth of objectivity"[2] without which it is "extremely difficult for natural science to advance beyond certain limits."[3] The new emphasis involves a revision of classical/modern concepts of the relations of subjectivity and objectivity. With regard to the place of the human subject in knowledge, science is in need of "radical change" if it is to "advance."[4]

Torrance is not suggesting a rejection of objectivity, but rather a rejection of "abstract objectivism" which

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[1]Ibid., 87. Torrance documents other new developments in terms of recognition of (1) a new multileveled model of reality, (2) the way we derive concepts, (3) the relation of science to ordinary experience and knowledge, (4) the multileveled structure of human knowledge (ibid., 71-87; Thomas F. Torrance, *Space, Time and Resurrection* [Edinburgh: The Handsel Press, 1976], 184-193; *Ground and Grammar,* 145; Ford, 273).

[2]*God and Rationality,* 99.

[3]*Theological Science,* 91. The world view that dominated science until today, held "that every part of the universe must be observable or objectifiable in the same way and be amenable to the same kind of coercive experimentation as obtained in traditional physics and mechanics, and amenable to the [same] logical forms" (ibid.).

[4]Ibid., 85ff. See ibid., 91. "We stand today at the point of transition, where we need to carry through the same sort of advance in theology as we have seen at different stages in the movement of modern science" (*Transformation and Convergence,* 279). Theology and science are poised to and must advance together (ibid., 282).

"conceals a static subjectivity."[1] He holds that classical nineteenth-century science involves methodological abstraction from all subjective factors in its concern for strict impartiality and disinterestedness. However, the theory of relativity and quantum mechanics show that a major change has taken place in the whole structure of scientific consciousness, knowledge, and basic concepts. It is now evident that there is no such thing as impartial science. He writes: "These facts are still having seismic effects in various branches of knowledge."[2]

For Torrance, the direction of the change in views of relations between objectivity and subjectivity is indicated by scientists, philosophers, and theologians such as Einstein, Bohr, Maxwell, Polanyi, Dilthey, Rutherford, Eddington, Weizäcker, and Barth.[3] Not surprisingly, the

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[1]"That knowledge proceeds by the conformity of the reason to the nature of the object has been reestablished. . . . [However,] *abstract objectivism* comes under severe criticism, for it conceals a *static subjectivity* in the uncritical acceptance of fundamental categories of the understanding" (emphasis mine) (*Theological Science,* 92-93).

[2]Ibid.

[3]A need for change in science in terms of subjectivity became evident when the "scientific method came to be applied beyond the realms of mathematics and physics, e.g. to history by Dilthey. . . . Einstein had to wrestle . . . with the Newtonian and Kantian conceptions of space and time before the theory of relativity could be formulated, whereas the advances in nuclear physics through the work of Maxwell and Rutherford forced physicists like Bohr to carry through a change in the whole structure of knowledge" (ibid.). "A.

theologian Torrance is influenced more by the theologian Karl Barth than by any other person.[1] The influence of these revolutionary thought leaders is one indication of Torrance's responsiveness to the postmodern shift.[2]

Eddington, M. Polanyi, and von Weizsächer . . . [show] how the personal factor inevitably enters into scientific knowledge for the very fact of our knowing explicitly enters into what we know" (ibid., 93). See *Transformation and Convergence,* 250; and "The Problem of Natural Theology in the Thought of Karl Barth," *Religious Studies* 6 [June 1970]: 121; hereafter cited as "The Problem of Natural Theology."

[1]Torrance was attracted to Barth's scientific dogmatics ("My Interaction With Barth," in *How Karl Barth Changed My Mind,* ed. Donald K. McKim [Grand Rapids, MI: Eerdmans, 1986], 52-64). Yet he seeks to go beyond Barth who was the most radical critic of modern theology and was far in advance of the modern frame of thought (*Transformation and Convergence,* viii). Torrance contends that Barth is not a dualist but rather thinks of God "as interacting closely with the world . . . without being confused with it" ("The Problem of Natural Theology," 121; see Klinefelter, 134). He also criticizes Barth's view of the use of science as focusing only on the material content of theology (*Transformation and Convergence,* viii, x). However, Galilee critiques Torrance's *Theological Science* as "yet more grist to the relentless Barthian mill" (David Galilee, "Review of Torrance, *Theological Science," Religious Studies 7, no. 4 [December 1971],* 376). Harink writes: It "is not that Torrance has moved beyond his mentor in any significant way, but that he has worked to fill in the gaps which might have left Barth more vulnerable to criticism" (Harink, 51).

[2]Langford comments on Torrance's extensive reading in the philosophy of science which calls for a revised notion of science, e.g., Eddington, Weizäcker, Polanyi, Kuhn (Langford, "T. F. Torrance's *Theological Science*: A Reaction," 155). On Polanyi's postmodernism see van Huyssteen, 577-578; John Haught and D. M. Yeager, "Polanyi's Finalism," *Zygon* 32 (December 1997): 543-566. Barth is increasingly viewed as a forerunner of postmodern thought (Küng, "Karl Barth and the Postmodern Paradigm," 19; Ted Peters, "Theology and Science: Where Are We?" 334-337).

From Dualistic to Unitary Thinking

Torrance links the recent shift in scientific models of objectivity and subjectivity with the overcoming of dualism in science. He writes of this shift in terms of

> a *third era* in which a very different conception of science has been forced upon us through the incompatibility of the old dualistic structures of thought with a widening range of empirical facts.[1]

For Torrance, dualism was the handicap of premodern and modern science.[2] In contrast to dualistic epistemologies, authentic science involves a unitary way of thinking.[3] As a

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Marcum argues that pluralism has inspired Torrance's model which is based on Eienstein's and Polanyi's scientific epistemology. Therefore, faith, the mode of rationality in theology, is viewed as a process of discovery (as in Polanyi) not revelation (as in Barth) (Marcum, 48).

[1]*Transformation and Convergence,* 70-71. This involves advance "beyond the eras of [premodern] Greek-essentialist and modern-instrumentalist views of science in which the fundamental concepts were deeply affected by a dualist outlook. . . . It entails radical changes not only in the first principles of science but in . . . the way they are derived from intrinsic features of the universe" (ibid., 70-71).

[2]In the pure sciences the dualistic way of thinking has collapsed and crashed and given way in an epistemological revolution to another and more concrete way of thinking in which empirical and theoretical components are found to be inextricably interwoven (ibid., 247-248). For Torrance, the premodern and modern dualistic cosmologies are obstacles to a proper understanding of the nature of science and theology. However, the post-Einsteinian "new" physics has overcome Ptolemaic and Newtonian dualisms (Harink, ii).

[3]For Neidhardt, Torrance is an heir to the unitary tradition (Neidhardt, xv, xxxiv-xxxv). For Torrance, the unitary Hebrew consciousness/epistemology is essential to grasp reality. Theology is not conforming to science;

result, he goes beyond the classical/modern mechanistic view of science and the cosmos which is identified with the work of scientists and philosophers such as Newton and Kant.[1]

In contrast to modern mechanistic science, the new science possesses "a spiritual authenticity" which is "a new expression of Christian thought," pointing "to the objective rationality of God."[2] This suggests that there is a single rationality shared by theology and science.[3] Therefore,

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science is conforming to theology. See *Theology in Reconstruction*, 14-15, 169-170; *Reality and Evangelical Theology*, 45; Thomas F. Torrance, "The Modern Eschatological Debate," *Evangelical Quarterly* 25 (1953): 45; "The Divine Vocation and Destiny of Israel in World History," in *The Witness of the Jews to God*, ed. David W. Torrance (Edinburgh: Handsel Press, 1982), 96; "Salvation Is of the Jews," *Evangelical Quarterly* 22 (1950): 165; *Space, Time and Resurrection*, 41-42; *Israel: People of God--God, Destiny and Suffering* (London: Council of Christians and Jews, 1978), 4-6, 14; *Ground and Grammar*, 73.

[1]*Transformation and Convergence*, 245.

[2]*Christian Theology and Scientific Culture*, 144.

[3]The foes of this view are mechanistic scientism and dogmatic, relativistic empiricism which avoid scientific objectivity creating a gulf between theology and experience (*God and Rationality*, 3-25). Harink lists Torrance's foes as positivist science and modern theology with its belief in scientific results. Against the first, Torrance argues that science's fundamental axioms depend on commitment/judgment. Against the second, he argues for rejecting supposedly scientific presuppositions (except the givenness and knowability of the object) so we can come as near as possible to knowing God. Within 'faith,' we may continue the positivist search for 'fact' (Harink, 50). Ironically, Klinefelter regards Torrance's theology as positivistic (Klinefelter, 130).

> the problems that many people have in relating theology to science or in thinking of theology itself as a pure science . . . appear to come from a rather obsolete notion of science.[1]

This section has demonstrated that Torrance is responsive to the postmodern shift in science. This is evident in his discussion of the four periods and three shifts in science, the radical/continuing nature of the third shift, the new conceptions of objectivity and subjectivity, and the shift from dualistic to unitary thinking. The next section further evaluates Torrance's responsiveness to the postmodern shift through a description of his discussion of a series of shifts in the use of science in theology.

The History of the Use of Science in Theology

This section continues the examination of Torrance's responsiveness to the postmodern shift by describing (1) his history of the use of science in overcoming theological dualism, and (2) his rejection of various contemporary options for the use of science in theology.

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[1]*Transformation and Convergence,* 264. "It is the deeper realization of that coordination which we have reached in our own times that has effected a profound change in our understanding of what science is about, and . . . of the relation between natural science and theological science" (ibid., 264).

Overcoming Dualism

For Torrance, in the premodern period the use of dualistic science has led to dualistic types of theology. The disjunction of the celestial and terrestrial realms in Greek science resulted in a theology in which God is detached from and unrelated to the world. In the radical dualism of Greek science the Christian message of a God who interacts with the world is construed mythologically.[1] However, not all premodern theology was dualistic. The most authentic trends in premodern theology recognized a need for a theological transformation of science. Thus the Church attempted a reconstruction of the dualist foundations of Greek science in order to transform the general frame of Western thought into a nondualist foundation in which the Judeo-Christian message could be expressed and take root.[2]

Torrance argues that modern Newtonian cosmology was no less dualistic[3] than premodern cosmology and has influenced

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[1]*Theology in Reconciliation,* 30, 268. See Weightman, 183.

[2]"Transformation in the Frame of Knowledge," in *Nesessariis Unitas,* ed. Richard Stauffer (Paris: Le Cerf, 1984), 399. See Weightman, 183.

[3]*Theology in Reconciliation,* 11-14, 44-46, 72-80; *Ground and Grammar,* 23-24, 68, 81; *Christian Theology and Scientific Culture,* 128-131, *Transformation and Convergence,* 205; Thomas F. Torrance, *Space, Time and Incarnation* (New York: Oxford University Press, 1969), 38-40. The Reformation marks the transition to the modern period

further development of the dualistic and mythological type of theology.[1] "This [modern] paradigmatic shape of mind" has had a "fatal bearing" "upon modern theology."[2] However, Torrance points out that there has been another transformation of science beyond classical modernity which facilitates the use of nondualistic science in theology. Therefore, some twentieth-century theologies are less subject to premodern and classical modern dualism and disjunction because of the use of recent transformational developments in science.

> Here where the old cultural split [dualism] is steadily overcome and the whole horizon of human inquiry is profoundly altered, the greatest benefits appear to derive from inter-disciplinary activity. There is no reason why theological

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(*Theology in Reconstruction,* 62-75, 262-264; *Theological Science,* 58-87; *Reality and Scientific Theology,* 12, *God and Rationality,* 39, 48-49; Thomas F. Torrance, *Divine and Contingent Order* (New York: Oxford University Press, 1981), 91-92; *Ground and Grammar,* 84; "What Is the Reformed Church?" 51-52. See Weightman, 186-187, and 197-198, nn. 32-35.

[1]In mythological theology "we can know nothing of Jesus as He is in himself in his own truth and personal reality, but only what the earliest Christians appeared to make of the phenomenon of Jesus as they clothed it with patterns of significance to suit their own spiritual needs and even created 'historical events' upon which to hang those patterns of significance. . . . We cannot really grasp any objective content in their knowledge, but can only seek through some symbolic reinterpretation to let what they did become a focus of meaning for ourselves" (*Transformation and Convergence,* 246-247).

[2]Ibid., 246; see *Reality and Scientific Theology,* 75.

> science which had to do with the whole relation of God to the universe should not benefit most.[1]

While Torrance writes of the overcoming of the use of dualistic science in twentieth-century theology, he is also critical of many late modern and postmodern proposals for the use of science in theology. Torrance's rejection of some of these proposals is surveyed in the next section.

Modern and Contemporary Proposals

Torrance makes a call for "a critical revision of our attitude to 'nature'" and of our attitude toward natural science.[2] He is not only critical of certain premodern uses of science but also of various modern and contemporary proposals as to what the new uses of science should be. Full description of these proposals is beyond the scope of this dissertation. However, Torrance's criticisms may be briefly surveyed.

In the first place, Torrance rejects the Neo-Protestant

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[1]*Space, Time and Resurrection,* 182-183. For Torrance, the use of science is facilitated by the fact that "the ever widening divergence between the special sciences, and not least the deep cultural split between the sciences and the humanities, are in the process of being overcome from below in the very foundations of our knowledge of the universe. . . . Each is what it is as a movement of human inquiry because of the profound coordination between human knowing and the space-time structures of the creation" (*Transformation and Convergence,* 248-249).

[2]*Theological Science,* 99.

models for the use of science which, like modern science, begin with anthropology and confuse the nature of the object of theology (God) with the subjective states of experience.[1]

Torrance also rejects as "extreme" certain modern "false ways that are undertaken to answer the critical questions as to the truthfulness of our theological statements."[2] These proposals for the use of science include the humanistic identification of truth with this worldly reality[3] and the mystical identification of truth with otherworldly reality.[4] Torrance also regards as extreme the uses of science in the liberal naturalization of

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[1]Ibid., 90-92. Torrance refers to "the great dénoument of Neo-Protestantism" (ibid., 92). "If theology is to survive the crisis of these times, it must move out into the full light of day, engage in critical revision of its own theoretical framework, and go on to fresh scientific construction under the pressure and determination of its own object" (*God and Rationality,* 5).

[2]*Theological Science,* 187.

[3]"The humanistic theologian answers critical questions "by identifying the Truth of God with this-worldly truth. . . . He denies that theological statements are empty of truth by claiming that they do not refer to a transcendent reality but only to realities within our mundane experience, of which they are symbolic expressions" (ibid., 187).

[4]The mystic "discounts the worldly involvement of the Truth and seeks to transcend it all by a sharp division between the transcendent Truth of God and all this-worldly truth. This is to seek a truth in sheer detachment from all that is finite--spaceless, timeless, ecstatic truth" (ibid., 188). Ironically, Torrance has been criticized for having a mystical theology (Morrison, "Thomas Forsyth Torrance's Critique of Evangelical (Protestant) Orthodoxy," 53-54, 61-63).

God and in the orthodox divination of nature.[1]

Torrance also rejects the uses of science proposed by mediating theologies such as Catholic analogia-entis, and Protestant romanticist-idealist, impressionist, and existentialist theologies. These theologies propose a likeness as well as an unlikeness between God and man which is the basis of analogical use of science in theology.[2]

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[1]*Theological Science,* 187. Torrance views liberalism and orthodoxy as related to the dualism of docetism and ebionitism (*Reality and Evangelical Theology,* 10). Harrink suggests that Torrance does not resolve the tensions between evangelicals or liberals. He holds doctrines that are rejected by modernity. Thus, he might be dismissed as a kind of theological liberal who likes orthodoxy (Harink, 11, 135-136). Trook agrees that Torrance's method contradicts fundamentalist and liberal models (Trook, x-xii). Morrison comments that while Torrance shares the concerns of orthodoxy, he positions himself between liberalism and orthodoxy. For Torrance, Carl Henry shows similarity with liberal and orthodox extremes. As Bultmann and Schleiermacher, he rejects an intelligibility whereby thoughts/statements come from objective sources outside the knower. For Morrison, Henry wrongly views Torrance as following Kierkegaard in irrationalism (Morrison, "Thomas Forsyth Torrance's Critique," 53-54, 61-63; see Torrance's review of B. B. Warfield's *Inspiration and Authority of the Bible* in *Scottish Journal of Theology* 7 [1954]: 104-108; *Ground and Grammar,* 36; *Reality and Evangelical Theology,* 19).

[2]"Between the two extremes [humanism and mysticism] is . . . the [Roman] way that . . . seeks to ground and justify theological statements in a movement that rises by analogical reasoning from the creaturely and the contingent to the Divine. . . . In its distinctive Protestant form, this is the way taken not only by the romantic-idealist theologians of the nineteenth century but even by thinkers like Albert Schweitzer who look upon 'the historical Jesus' not as giving us any direct knowledge of God but as providing us with an impressionist picture . . . through

Finally, Torrance rejects the use of science in the "new" theologies[1] of John Robinson, Harry Williams, Paul van Buren, and Werner Pelz, and the "God is dead" theology of Thomas Altizer and William Hamilton because of their use of dualistic epistemology inherited from modern science.[2] He also rejects the destructive criticism of "irrational" or anti-reason theologians who reject science. While they have correctly rejected the "false objectivism" of modernism, they have wrongly sought a false "transcending of the subject-object relationship altogether." He links this approach with the fact that these theologians have chosen to

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which somehow we 'tune in' . . . to the truth in the anonymous spirit of 'Jesus'. Another version of this is found in the teaching of Rudolf Bultmann who treats the whole framework of the Gospel as 'myth' but uses it as the occasion for an existential decision" (*Theological Science*, 189-190).

[1]These "new" theologies are increasingly recognized as postmodern (see chapter 1).

[2]*God and Rationality*, 29, 41-42, 55, 83, 93-94; Klinefelter, 132-134. Agnew questions whether Torrance's view of "new" theology is a result of his too-close relation to science. Did he fall into what he has called "the temptation of Protestantism" "to counteract individualistic subjectivism by assimilation of its thought to empirical science"? For Agnew, an affirmative answer is implied in Torrance's view of "new" theology as a fruit of false science to which he opposes true science "under control of transubjective realities." See Mary Agnew, "The Concept of Sacrifice in the Eucharistic Theology of Donald M. Baillie, Thomas F. Torrance, and Jean-Jacques von Allmen" (Ph.D. diss., Catholic University of America, 1972).

be "insulate[d] . . . from disciplined science."[1]

In summary, while he does not identify himself as postmodern, the relevance of Torrance's model to the postmodern situation is evident in his discussion of the historical periods or shifts which climax in the "recent" postmodern shift in science and its use in theology. For Torrance, the new science is useful in the overcoming of theological dualism. However, he is critical of various contemporary models for the use of science in theology. In brief, Torrance's model is responsive to, as well as critical of, the postmodern shift in science and its use in theology. Now that Torrance's historical survey of science and its use in theology has been reviewed, the nature of the model he proposes for the use of science in theology may be described and evaluated for coherence in the next section.

A Christological Model for the Use of Science in Theology

The responsiveness of Torrance's model to the post-modern shift in science and its use in theology was surveyed in the previous section. This section addresses the

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[1]*Theological Science,* 311. They are "driven into existentialism and phenomenology" or "cultural expressionism and sociology" in "the flight from scientific objectivity" (*God and Rationality,* 3) (Agnew, 196-197). This is evident in those who keep on insisting on what they call "the non-objectifiability" of God (*Theological Science,* 311).

following questions: What is the nature of Torrance's model in terms of his view of science and his view of theology?[1] Is his model coherent?[2] In order to answer these questions, Torrance's model will be described in terms of whether it is controlled more by his Christology, Bibliology, or Natural Theology. It will also be evaluated in terms of whether these influences on his model are coherent with each other.

The Nature of Science

In this section, Torrance's view of science will be surveyed in preparation for a later description of his model for the use of science in theology. This survey will include (1) his high view of science, (2) his views on relations between general "Science" and "the sciences," and (3) his views on the characteristics of general "Science."

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[1]Torrance's views of science and theology are presented together because of their similarities. His view of science is a suitable prelude to his view of theological science. Further, his view of science needs to be further described because any theological model for the use of science gives some interpretation of science influenced by some theology.

[2]Despite the positive evaluations of Torrance presented at the beginning of this chapter, some scholars are critical of his model. For Harink: "Torrance misunderstands the nature of both science and theology." "He does not yield a concept of the nature and method of theology that will stand the tests and needs of the church today" (Harink, iii).

A High View of Science

Torrance's model for the use of science in theology is influenced by his high view of science. He acknowledges the dominant/normative role of science in contemporary culture. He writes: "We live in a world which will be increasingly dominated by empirical and theoretical science."[1] "[W]hether we like it or not the whole of the future will be dominated by empirical science and anything that fails to stand up to its rigorous discipline will fall away."[2]

However, Torrance's model does not simply acquiesce to the contemporary view. Rather, it is based on a theological interpretation of science. He holds that "natural science is a religious operation"[3] providing a scientific experience of revelation. In fact, he regards scientific inquiry as "the orderly medium for divine revelation"[4] and theology.[5] He also suggests that it is the "world unfolding under man's scientific inquiries which constitutes the medium in which

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[1]*Transformation and Convergence,* 263.

[2]*God and Rationality,* 51; *Space, Time and Incarnation,* ix. All "future life and thought will be dominated more and more by pure and applied science." Like science, "theology must learn to think with its own kind of precision and its own disciplined controls" (*Theology in Reconstruction,* 13).

[3]*Ground and Grammar,* 112.

[4]*Divine and Contingent Order,* 1-2.

[5]*Reality and Evangelical Theology,* 27.

God makes himself known and in which man may express knowledge of him."[1] The next section of this chapter describes Torrance's view of science in terms of his view of the distinction between "Science" and "the sciences."

Science and the Sciences

Torrance's model for the use of science in theology is also influenced by his view of "Science" and "the sciences." Here his writing manifests a certain ambiguity or semantic complexity.[2] On the one hand, (1) "there is no Science in the singular, for there are only sciences"; and (2) "there is not such a thing as a scientific way of acting and thinking which is to be pursued in every field of learning and discovery."[3] Therefore there is a significant limit to the use of "Science" in theology because each field of

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[1]Ibid., 27. Torrance takes revelation seriously (*Space, Time and Resurrection,* 1) in the OT and NT, in Christ (ibid., 2), and in the world. He prefers God-man-world and logos models rather than God-man and mythos models *(Reality and Evangelical Theology,* 27-30). Klinefelter argues that Torrance challenges Tillich's conception of revelation (Klinefelter, 128-129).

[2]See section on Semantic Complexity in chapter 1.

[3]*Theological Science,* 106-107; also 113. The new science studies things according to their natures and in light of structures in which they are imbedded. This restricts the transfer of concepts of science to theology (*Transformation and Convergence,* 87; also *Theological Science,* 107).

research including theological science has a different *material* scientific procedure appropriate to itself.[1]

On the other hand, "Science" is a "basic way of human knowing which is found to operate in every field of human experience, in religious as well as natural knowledge."[2] "There are general principles of knowledge relevant to every field of knowledge."[3] "There is thus a procedure common to every science, *formal* scientific procedure."[4] In this sense, there is a formal use for science in theology.

The ambiguity of Torrance's discussion of "Science" and "the sciences" results from his proposal that while formal "Science" and material sciences may be distinguished, they cannot be separated. Therefore, Torrance's model includes

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[1]*Theological Science,* 112. Theology cannot build upon the foundations of science or accommodate to its changes. However, it must see what these changes say about the changes theology must make in its own field. It must shake free of the dualist principles of knowledge which have so insidiously affected it. It would never have succumbed to these had it been faithful to its own scientific objective *(Transformation and Convergence,* 249-250).

[2]*God and Rationality,* 114. Science is clear, precise knowledge. There is no esoteric way of knowing in science or theology (ibid., 114). We cannot oppose science and theology as though they could be contradictory. We regard them as applying one basic way of knowing to their respective fields and seek to coordinate the knowledge they yield by the appropriate modes of inquiry and thought they develop (*Ground and Grammar,* 10; also 7-19).

[3]*Theological Science,* 113.

[4]Ibid., 112.

the use, not only of formal/general "Science," but also the use of "the sciences" in theology. Despite his distinction of general and particular sciences, there is no "distinct 'general science'" that can be used in theology. Rather, "there are only particular sciences."[1] Therefore, the issue of the use of general science in theology cannot be separated from the issue of the use of particular sciences.[2]

In preparation for further description of Torrance's model for the use of science in theology, his description of the principles of general "Science" will be surveyed in the next section. This is because

> in each particular field [including theology] science requires a modification of its formal procedure in a way appropriate to the distinctive nature of the object or the matter under investigation.[3]

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[1]Ibid., 111. "There are only particular sciences . . . [which] all have certain fundamental principles in common" (ibid., 112). "Scientific activity . . . is essentially open and flexible through fidelity to the manifold character of reality and is therefore universally applicable" (ibid., 107). We must not separate the forms of scientific procedure too sharply. The *scientia generalis* cannot be abstracted [see *Theology in Reconstruction,* 58-59; *Ground and Grammar,* 10] into an independent *scientia universalis* without becoming artificial, arbitrary, and imperialistic (*Theological Science,* 113-114). Also, "it is important not to confuse philosophy with *scientia generalis*" (ibid., 114; also 114-116).

[2]The second issue is in part a matter of apologetic science-theology dialogue (ibid., xii, xvii; Klinefelter, 118).

[3]*Theological Science,* 112. This involves distinctions

General Science

As will be documented in the subsequent section, Torrance defines theology as a science. Therefore, for the purpose of clarifying his model for the use of science in theological science, it is useful to survey his outline of five formal principles of general science which are present in every special science, including theology.

First, the primary element of science is objectivity. Science is "governed by the material content of its knowledge."[1] Second, in the sense of "what the Germans call *wissenschaftlich*, . . . [science] is a rigorous, disciplined, methodological and organized knowledge."[2]

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between formal subjectivity and material objectivity (ibid., 112). However, our basic objectivity has a basic subjectivity (ibid., 12). We bring rationality to light as we let reality disclose itself and we submit our minds to it (ibid., xi-xii, 11-12). For Harink, Torrance allows subjectivism to enter at the crucial point. He stresses the objective over the subjective while allowing massive subjectivism. Torrance has a privileged 'stage-door' access (says Carl Henry) to knowledge of God (Harink, 50, 118). For Henry, he "seems to be privy to objective propositional knowledge about God which his methodology pointedly disallows to other human beings" (Henry, 3:223). This is a rejection of the biblical model and reflects the dialectical epistemology to which much of twentieth-century religious theory is indebted (3:214).

[1]*Theological Science,* 116-117.

[2]Ibid., 116-117.

Third, science searches for the "elemental form" or "basic order" which is within "objective reality."[1] Fourth, science is self-correcting in its search for new knowledge of its object.[2] Fifth, science includes questions and answers which "penetrate intuitively into the order" of its object of study.[3]

In this section, Torrance's view of science has been surveyed in terms of his high view of science, his apparently ambiguous distinction between "Science" and "the sciences," and his view of the formal principles of general science. This has prepared the way for a description, in the next section, of the nature of Torrance's model for theology and for the use of science in theology.

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[1]Ibid., 116-117. "The theories or laws formulated to bind together these elemental forms must not be identified with ontic structures for they are only theoretic structures, yet as such they must be determined by and point to ontic order inherent in the material of our inquiry" (ibid., 117-118).

[2]Ibid., 120-121. "Scientific] inquiry . . . is open to new knowledge[, it] takes the form of questioning in which we allow what we already know or hold to be knowledge to be called in question by the object" (ibid.).

[3]Ibid., 126. "Scientific method . . . [includes] the *problematic* form of thinking . . . in which we throw forward . . . our questions and answers into an ordered sequence which enables us to *penetrate intuitively into the order* in the nature of the object" (ibid., emphasis mine).

The Nature of Theology

Now that Torrance's view of science has been surveyed, the nature of his model for theology and, therefore, for the use of science in theology will be described. This will be done in terms of the influence of the study of Christ (Christology), Scripture (Bibliology), and nature (Natural Theology) on his model for the use of science in theology. First, the influence of Christology on his model will be described. Then the coherence of that influence with his Bibliology and Natural Theology will be explored.

Christology

Torrance's model for the use of science in theology may be clarified in light of the similarity between his views of the nature of science and the Christological nature of theology. Similarly to his description of his view of science,[1] Torrance's view of theology is described in terms of a high view of theology, general science and theology, and theology among the special sciences.

A high view of theology

Torrance not only has a high view of science in general.[2] His high view of theological science is evident

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[1]See section on The Nature of Science above.

[2]See section on The High View of Science above.

in that he regards theology as able to apprehend knowledge of God in Christ. He defines theology as "the unique science devoted to knowledge of God differing from other sciences by the uniqueness of its object."[1] The fact that the study of Christ is a key element in Torrance's model is evident in that he expands his definition of theology to include Christology. In fact, Christ is the object of his theology. It is the science of the knowledge of God in Christ. "In theology we are concerned with God in Jesus Christ . . . and a mode of knowing appropriate to His unique nature."[2]

Torrance's model for the use of science in theology is responsive to the question whether the effect of sin makes science unfit for use in theology. According to Torrance, God overcomes this problem through His revelation in Christ.

> In knowing God I am deeply aware that my relation to Him has been damaged, that disorder has resulted in my mind, and that it is I who obstruct knowledge of God by getting in between Him and myself, as it were. But I am also aware that His presence presses unrelentingly upon me through the disorder of my mind, for He will not let himself be thwarted by it, challenging and repairing it,

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[1]*Theological Science,* 281.

[2]Ibid., 281. The object of theology "can be apprehended only in its own terms and from within the actual situation it has created in our existence in making itself known" (ibid., 281). See Paul D. Molnar, "God's Self-communication in Christ: A Comparison of Thomas F. Torrance and Karl Rahner," *Scottish Journal of Theology* 50 (1997): 288-320.

> and requiring of me on my part to yield my thoughts to His healing and controlling revelation.[1]

In addition, scientific theology cooperates with God's revelation in Christ to overcome distortion caused by sin.

> Scientific theology is active engagement in that cognitive relation to God in obedience to the demands of His reality and self-giving. In it we probe into the problematic condition of the human mind before God and seek to bring knowledge of Him into clear focus, so that the truth of God may shine through to it unhindered by its opacity and the human mind may acquire clear and orderly forms through which to apprehend and conceive His reality.[2]

General science and theology

Torrance's discussion of "Science" and "the Sciences"[3] has direct implications for his model of the use of science in theology as a Christological science. On the one hand, theology is a unique special science which develops its unique "material" method and theory[4] in accord with its

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[1]*Theological Science,* ix.

[2]Ibid., x.

[3]See section on Science and the Sciences above.

[4]For David Galilee, Torrance compromises his claim that theology is a science. "One cannot resist the conclusion that what he gives with the one hand he takes away with the other" (Galilee, 375). Galilee prefers the view of Austin Farrer, that theology is a scientific only in "the following out of thoughts started by science. . . . Since God is not a part of the world, still less an aspect of it, nothing that is said about God, however truly, can be a statement belonging to any science" (Austin Farrer, *A Science of God?* [London: Geoffrey Bles, 1966], 28-29; Galilee, 377). Harink

unique, divine object—God in Christ.[1] On the other hand, there is a use of the principles of general science (with regard to formal subject-object relations) in the method of theology.[2] In addition, Torrance's distinction without dichotomy between "Science" and "the sciences"[3] impacts his description of the use of general science and the use of individual sciences in theology as a Christological science.

Torrance describes the formal principles of the special science of God in Christ in terms of the formal five-point typology of *scientia generalis*. In each case he applies the

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comments: "Torrance insists, not quietly, on the scientific nature of theology. We must do so too, but less loudly, surely, and with a good deal less determination of the meaning of 'science,' and a good deal more flexibility in the meaning of 'theology.' Otherwise 'science' loses its applicability to those areas where it legitimately belongs, and theology loses its ability to speak of matters other than epistemological, such as sin, salvation, discipleship and love of God, in other than epistemological terms" (Harink, 134).

[1]*Theological Science,* 25. Theology is "concerned with God in Jesus Christ as the truth, and therefore we are concerned with a mode of knowing appropriate to His unique nature" (ibid., 113).

[2]Formal theology as "concerned with our human knowing of God, i.e. with a mode of knowing appropriate to human minds and subjects, wherever there is a subject-object relationship (ibid., 113). See "The Science of God," *Reality and Scientific Theology,* 64-97, 75; and "Theological Science," *Ground and Grammar,* 110-145.

[3]See section on Science and the Sciences above.

formal principles of science in theological science in terms of an essential relation to Christology.[1]

The five christological principles expressing the formal principles of science are as follows. First, science is objective, therefore there is a need for scientific theological objectivity in terms of submission to the object of theology, which is Christ.[2] Second, as in every science, theological methodology must be governed by the material content of its object, which is the personal Christ.[3] Third, since science searches for the elemental form and basic order of objective reality, theology must seek the elemental form or basic order of its object which is a divine as well as a human objectivity in Christ.[4] Fourth,

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[1]See section on General Science above in this chapter.

[2]*Theological Science,* 131. "The primary thing . . . is the utter lordship of the Object, its absolute precedence, for that is the one all determining presupposition of theology" (ibid.).

[3]Ibid., 133-135.

[4]Theology "takes place on earth, in the midst of earthly objectivities" (ibid., 135). It is a dialogue God conducts historically and dynamically with His people by His word (ibid., 136). He made "His divine Objectivity overlap with ours . . . and within that overlap created by His Grace, He stands before us in Jesus Christ" (ibid.). "To try to get behind this creaturely objectivity, . . . and so to deal directly with ultimate and bare divine objectivity . . . [is] the *hybris* of man who seeks to [get] . . . a footing in ultimate reality. Scientific theology can only take the humble road in unconditional obedience to the Object as He has given Himself to be known" (ibid., 137).

like science which is open to new knowledge, theology is characterized by openness to new knowledge of its object. Therefore, Christ is not an abstract, systematic principle which confines or limits theology.[1] Fifth, theology is like science which intuits the order of its object. Theology orders questions and answers to penetrate intuitively into the order of its divine object. This process takes place in relation to a divine demonstration[2] of the divine-human

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[1]Ibid., 138. Christ "is the norm and criterion of our knowing and it is out of correspondence to Him that theological coherence grows" (ibid.). "It is the centrality of Christ that is all-determinative. . . . Scientific theology is systematic . . . [in] relation to Christ. . . . We cannot abstract it from a direct diological encounter with God in Christ" (ibid., 138; *Theology in Reconstruction,* 117-149). Christ is "The Word of God and the Response of Man," in Israel, Christ, and Church (*God and Rationality,* 137-164). Theology "proceeds by constant reference to its *source and sole norm in the Word of God,* so that our theological terms and formulations are ever to be brought back to the bar of the Word for criticism and creative reorientation in direct personal dialogue between ourselves and God" (emphasis mine) (*Theological Science,* 307).

[2]The demonstration is in strict accord with the divine nature of its Object (ibid.). One cannot say exactly how knowledge is discovered in science and revealed in theology. However, a direct intuitive and dialogical encounter with revelation is scientific (ibid., 125-161; *Christian Theology and Scientific Culture,* 117-119). For Trook, Torrance views reality by intuitive immediacy with Christ through a kinetic mode of thinking (faith) which requires thought conversion (Trook, 43-48). Harink argues that science can't presuppose its knowledge content and then withdraw it from verification or shaping by objective criteria. Like Pannenberg, he holds that theology deals with the objects and events in which God is co-given. We must keep in mind that it is God we seek and avoid materialistic reductionism (Harink, 119-131).

truth[1] through the Spirit of Christ.[2]

In this section, Torrance's high view of theology as a science has been expressed Christologically and in response to the problem of sin. The formal/general principles of Torrance's theological science have also been surveyed. For him, there is a distinction without dichotomy between general science and individual sciences.[3] Therefore, there is no dichotomy between (1) use of formal principles of general science in theology and (2) use of special sciences in theology. The issue of the nature of the use of special sciences in theology is explored below.

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[1]Christ has earthly, human, and historical objectivity. Thus theological statements require the kind of verification appropriate to these fields. What we have to deal with is not divine Truth and human truth, but divine-human Truth (*Theological Science,* 139; *Transformation and Convergence,* 253-256). We cannot bridge the authority and truth of theology and the ultimate authority and objectivity of the Truth of God. However, the divine-human Jesus is personal, propositional, dialogical, temporal, historical, sacramental Truth that interprets Himself *(Theological Science,* 125-161; *Christian Theology and Scientific Culture,* 117-119).

[2]*Theological Science,* 139-140. "Only those who take the way in which God reveals Himself in the contingent particularity and sheer singularity of Jesus Christ may know Him and bring themselves within the area where the Object provides His own demonstration of His reality" (ibid.).

[3]See section on Science and the Sciences above.

Theology among the special sciences

The nature of Torrance's model for the use of science in theology is evident not only in his view of the theological use of the formal principles of general science.[1] It is also evident in his proposal of the use of special sciences in theology. On the divine side, theology is objective in focusing its scientific method on investigating its object, which is God.[2] However, on the human side, the object of theology is the revelation of God in Jesus Christ in the world. Therefore, theology cannot be objective/scientific without dialogue with the sciences.[3]

On the one hand, this use of science is coherent with the formal similarities Torrance proposes between theology and the other sciences. Theology resembles other sciences in its: (1) human inquiry, (2) respect for objectivity, (3)

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[1]See sections on Natural Theology and the Sciences and Dialogical Use of Natural and Human Sciences below.

[2]Theology is objective science centered in God (*Theological Science*, viii, x). Harink complains that he "makes Barth's 'one distinctive rule' for theology, namely the principle of objectivity, the only requirement for any and all knowledge to claim the name of 'science'" (Harink, 10).

[3]*Divine and Contingent Order*, 1-2. For Torrance, theology deals with God only as He has established man in the world in relation to Him-self within creaturely objectivities. For that reason we are to maintain faithful/responsible relations to worldly objectivities according to their creaturely nature (*Theological Science*, 56).

questions, (4) coordination of number and word, (5) concern for order, (6) freedom from preconceived metaphysics, (7) discipline and rigor, (8) logical economy, simplicity, and elegance, (9) openness to interrogation by the data, (10) construction and testing of theory, analogues/models, (11) recognition of limits, (12) relating scientific language to ordinary language,[1] and (13) dogmatic attitude.[2]

On the other hand, there is a sense in which, for Torrance, there is a limit to the use of special sciences in theology because of material Christological differences between theology and the other sciences.[3] However, even

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[1]*Theological Science,* 106-140, 203-295; *God and Rationality,* 89-136; *Christian Theology and Scientific Culture,* 18-19, 113-114; Alan Willingale's review of *Theological Science, Evangelical Quarterly* 42 [1970]: 187-190; Klinefelter, 121-122. With regard to order (point 5), see Thomas F. Torrance, *The Christian Frame of Mind: Reason, Order, and Openness in Theology and Natural Science* (Colorado Springs: Helmers & Howard, 1989), 17-34.

[2]With regard to dogma (point 13): "Christian dogmatics is the pure science of theology in which . . . we seek to discover the fundamental structure and order in the nature of things and to develop basic forms of thought . . . as our understanding is allowed to be controlled by them" (*Theological Science,* 338). Torrance identifies Christian dogma with Christ and Christian dogmas with the Church's understanding (344-345). He also discusses the history of the term dogmatics (338-341), the difference between dogmatic science in natural science and in theological science (341-344), and fluid dogmatics as disclosure models (*Reality and Evangelical Theology,* 49-51; *Theological Science,* 345-352; *Transformation and Convergence,* 267-269; *God and Rationality,* 89-95).

[3]See section on General Science and Theology above.

these differences with other sciences have specific uses in theology in terms of indirect comparison with theology.[1]

These differences from other sciences include: (1) the epistemological inversion in the order of knowing as divine revelation not human discovery, (2) theological inquiry as dialogue with a personal God, (3) the double objectivity of God and His revelation in Christ, (4) the cruciality and supremacy of the revelation in Christ,[2] (5) the unique rationality based on the unique Object and objectivity,[3] (6) the subject-object relation which starts with a union rather than a disjunction of the knower and the Known.[4]

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[1]Specific uses of science in theology arising from indirect comparison will be surveyed below.

[2]*Theological Science,* 137.

[3]Ibid., 139. In the sciences we do not deal with anything only in terms of itself. We always refer facts to other facts in an endless regress within an essentially relative conception of truth. However, in theology we do come up against ultimate objectivity and our thought is given a final term of reference (ibid., 297). In theology "as in natural science, relativity and objectivity fall together, but they are differently grounded" (ibid.; also *God and Rationality,* 102-103; Klinefelter, 122-123). While "theological and natural science each has his proper objective to pursue[,] . . . their work inevitably overlaps, for both operate through the same rational structures of space and time" (*Transformation and Convergence,* 264).

[4]This union is not entangled with our subjectivity but promotes a reciprocal relation (*Theological Science,* 305) communicated in antropocentric language (ibid., 309-310). Theology and science are movements of human inquiry because of relations between knowing and the known (*Transformation and Convergence,* 264). We "do not abstract theological

In summary, Torrance's proposal of the use of special sciences in theology based on their indirect comparison with theology is influenced by his Christology. As demonstrated in the previous section,[1] Torrance's model for the use of formal methods of science in theology is also influenced by his definition of theology in terms of Christology. For Torrance, the revelation of God in Christ overcomes the distortion caused by sin in scientific procedure.

Two issues of possible ambiguity have arisen in this section. First, is God the object of theology, or is God in Christ the object of theology? Torrance complicates this further by referring to a double objectivity of God and His revelation. Second, are the formal principles of science defined in terms of God or in terms of Christ or in terms of both? This ambiguity will become further compounded as Torrance defines the object of theology as God in Christ in Scripture in the world.[2] What would prevent one from

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knowing from what is actually known for its structural forms cannot be uprooted without alteration from their inhesion in doctrinal substance. Hence *no direct comparison* between theological science and the special sciences is possible. . . . The only kind of comparison that would be apt would be . . . *between the relations subsisting between the knower and the object in one field of knowledge and that between the knower and the object in another field of knowledge"* (*Theological Science,* 284-285, emphasis mine).

[1]See section on General Science and Theology above.

[2]See section on Natural Theology below.

defining scientific theology in relation to all these stages of the revelation of God? The next section of this chapter further describes and evaluates the coherence of Torrance's Christological model in terms of the influence of his Bibliology on his model for the use of science in theology.

Bibliology

That Bibliology is an important element in Torrance's model for the use of science is evident in that he expands his definition of theological science in the following way. Theology is the science of the knowledge of God in Christ in Scripture.

> It is thus a Bible-related revelation of God that we must have in view and seek to interpret, for it is in that articulate form of human word, spoken and written, which divine revelation has taken in space and time, that God continues to make himself known to us as we meditate upon the Holy Scriptures and hear his Word addressing us.[1]

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[1]*Reality and Evangelical Theology*, 84. "We must get ourselves into the position where we can really listen . . . [so] we are able properly to appreciate the documents . . . and to judge what they say in the light of the object [Christ]" (*Theological Science*, 332-333; see also Langford, 167). Scripture is dead unless enlivened by the personal locution of God (ibid., 20f.). "We have to re-live encounter with the Object, allowing ourselves to be re-addressed by him, rethinking his Word to us, and responding to his action upon us" (ibid., 137; and *The Christian Frame of Mind*, 79-81). David Galilee faults Torrance for rigid notions of hearing the word of God where God works 'on' but never 'in' us"; for emphasis on hearing as excessively conceptual and verbalized; and for a tendency to 'idolatry' of the spoken word" (375). A contrary view is given by Langford: "In spite of the initial emphasis on auditory

The degree of coherence between the influence of Christology and Bibliology on Torrance's model for the use of science in theology will be investigated in this section. This will be done in terms of (1) Christ and Scripture as sources and norms of theology and thus as sources and norms of the use of science in theology, (2) the use of the formal principles of science in the contrapuntal study of Christ and Scripture, and (3) the use of historical science in the contrapuntal study of Christ and Scripture.

Sources and norms

Torrance refers to Christ and Scripture as sources and norms for theology and for the use of science in theology. At times he seems to imply a normative priority of Christ over Scripture. This seems to be the case in his discussion of the functions of Christ and Scripture in the scientific material and formal verification of Christian theology. It seems that Christ is described as both a formal and a material norm while Scripture is described only as a formal and not as a material norm.

> *Formally considered*, the verification of our theological statements consists . . . in their

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knowledge, Torrance does not make extensive use of the notion. He, of course, wants to say that it is illicit to construe all knowledge on the model of vision" (Langford, 160, n. 2). On auditory knowledge see Robert Funk, *Language, Hermeneutic, and Word of God* (New York: Harper and Row, 1966).

> reference to *Jesus Christ* in the way in which knowledge of Him reaches us through the Church and through the witness of Him *in the Scriptures* in the midst of the Church. *Materially considered,* the verification of theological statements is found *only* in the Grace of God *in Jesus Christ,* as He actively gives Himself in His own Being through the power of the Spirit to be the object of our knowledge (*per modum entis*) and the justification of our human modes of knowing and speaking of Him as we seek to act in conformity to His Word and Truth in Jesus Christ.[1]

The distinction and relation between Scripture and Christ with regard to formal and material norms[2] lead to the following question. Is the source and norm of the use of science (1) Christ-interpreted in the light of Scripture or (2) Scripture-interpreted in the light of Christ, or (3) both interpreted in light of each other? The answer to this

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[1]*Theological Science,* 199-200 (emphasis mine); see also 191-192. He refers to Christ in relation to Scripture as the formal norm, and to Christ in distinction from Scripture as the material norm.

[2]For Torrance, human logic is *formal* theologic for the understanding of divine logic. The incarnation gives ontological import to the translogical relations of various levels ensuring relevance. However, *formal*/symbolic logic abstracts from existence and actuality to the timeless and motionless (ibid., 222, 228, 226, 258, 269-276; see "The Basic Grammar of Theology," *Ground and Grammar,* 146-178). Marcum sees Torrance's view of existence statements as expressive of intuitive apprehension (Marcum, 49-53). For Torrance, theological statements "are *formally* correct statements, accurately related to the truth, as they are in obedient conformity to the word of God addressing us in Christ through the Holy Scriptures" (*Theological Science,* 192, emphasis mine). "Theological truth has, therefore, its essential *basis* in the kerygmatic and didactic material of the New Testament Scriptures" (ibid., 160-161).

question is discovered in Torrance's scientific contrapuntal method which is described in the next section.

Contrapuntal method

Torrance's model for the use of science has special application to the study of Scripture. He describes scientific study of Scripture in terms of a contrapuntal study of Christ and Scripture in light of each other. For Torrance, this method is scientific because it operates within the boundaries of the ways and acts of God out of which the Scriptures arose.[1] This seems to involve a distinction between Scripture and the ways and acts of God based on the distinction of formal and material norms introduced in the previous section. Scripture and Christ are interpreted in relation to each other. However, the emphasis seems to be on Scripture interpreted in the light of Christ, rather than on Christ in the light of Scripture.

This leads to four elements of a contrapuntal method. First, contrapuntal interpretation must attend to the scope of divine revelation in Scripture which is Christ.[2] Yet there is a clear distinction between theological statements

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[1]*Reality and Evangelical Theology*, 101, 107-108.

[2]Ibid., 101, 107. For Trook this leads to interpretation of the deep but non-devious referential truth of biblical text as compatible with contemporary science (Trook, 7-8).

and material truth, as between scientific statements and material truth.[1] "*Materially* considered, our theological statements are true through a content in the Truth which God alone gives them by His Grace."[2]

Torrance seems to apply this idea of verification by grace not only to statements by contemporary theologians but also to the statements of Scripture. Therefore, there is a clear distinction between biblical statements and material truth as there is between scientific statements and material truth. This means that

> the *real* text with which we are concerned is not the letter of the Scriptures as such but the Humanity of Christ including His historical Life and Work, that is, the actual way in which the Word of God has objectified Himself for us within our human modes of existence in space and time,

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[1]Transcendent reference has been criticized as a non-logical bridge (Klinefelter, 127). For Torrance, in "our knowledge of external reality, creaturely or divine, we cannot account for its comprehensibility; there is no purely theoretical bridge between our thinking and the objective reality of existence. Rightly taken this does not produce scepticism but what Einstein calls 'awe' before a mystery which we shall never understand" (*Theological Science,* 184).

[2]*Theological Science,* 195. "Verification [is] by the Grace of God" (ibid., 198-199; also *Theology in Reconstruction,* 150-191; *God and Rationality,* 56-85; *The Christian Frame of Mind,* 1-5). This raises the issue of "when" does grace makes statements true. Is Scripture a materially true revelation? *(Reality and Evangelical Theology,* 153; *Transformation and Convergence,* 304). For Torrance, "there is no proof of the truth or of our knowing or speaking of Him apart from actual engagement with the Truth, in dong the truth and being true" (*Theological Science,* 200).

> and has revealed Himself within our human speech and thought.[1]

Second, scientific contrapuntal interpretation must attend to the grounding and ordering of Scripture in the Words and Acts of God. This means that the coherence of biblical statements is "at once personal and propositional, that is dialogical."[2] This coherence

> is not one which they have independently in themselves which can be read of their grammatical, syntactic, or formal-logical sequence but one which they acquire from beyond themselves . . . [in] *contrapuntal* relation . . . to events in his [God's] saving and revealing self-communication.[3]

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[1] *Theological Science,* 193. John Morrison, "Thomas Forsyth Torrance's Critique of Evangelical (Protestant) Orthodoxy," *Evangelical Theology* 67, no. 1 (1995): 59; Roger Lundin, "Introduction," *Disciplining Hermeneutics: Interpretation in Christian Perspectice,* ed. Roger Lundin (Grand Rapids, MI: Eerdmans, 1997), 8; I. Howard Marshal, "To Find Out What God Is Saying: Reflections on the Authorizing of Scripture," in *Disciplining Hermeneutics,* 49-55.

[2] *Theological Science,* 146. "Identity of Word and Person . . . is a primary characteristic of the Truth of God . . . in Jesus. It belongs to the nature of this Truth to be at once Person and Message, to be personal Being and yet communicable Truth" (ibid., 147). "Theological statements have a truthful reference to this Truth when that reference is at once personal and propositional, that is dialogical" (ibid., 146).

[3] *Reality and Evangelical Theology,* 108, emphasis mine. Scientific theology involves scientific "penetration" into "'the interior logic' and 'the material mode of speech of theology deriving from Christology" (*Theological Science,* 119). "It will be through ruthless and relentless Christological criticism of all our knowledge of God that we will be able to distinguish, as far as possible, between genuine and false objectivity" (ibid., 43).

For Torrance, Scripture is to be interpreted not only in relation to God's Words and Acts prior to and during the production of Scripture. His "realist" understanding of the incarnation holds that "we are in direct contact with the ultimate Reality and Truth of God in our spatiotemporal existence."[1] Otherwise we would only be able to interpret Scripture unscientifically as consisting of human forms of thought and speech. Such thought and speech has only a this-worldly creaturely meaning, symbolic, mythological, oblique, conventional, or fictional with reference to God.[2]

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[1]*Reality and Evangelical Theology,* 109. For Morrison, the historical God-world-human relation, as embodied in the thought of Kierkegaard, Barth and Torrance, is problematic. For them, Christianity hinges on difference, otherness, dissimilarity, and ambiguity about regarding history. Though healing much of Barth's bifurcated notion of time, Torrance has taken the same line. He does not deal adequately with unitary, asymmetrical God-human-world relatedness or the openness of creation to the Creator in real interactivity of God's revelation in the Word made flesh. Scripture points beyond itself to Christ only in participation in the movement of God's revelation. To repair this, Torrance might go the way of Tillich or Calvin. Tillich provides a way of divine-human-world/ differentiation and a form of divine-human-world unitary relation. Calvin provides for theological and historical textuality and the simultaneous authority and humanity of Scripture (Morrison, "Thomas Forsyth Torrance's Critique," 64-68).

[2]*Reality and Evangelical Theology,* 110. Torrance ambiguously suggests that theology must elaborate its own symbolic denotation in order to check its purity and precision and avoid intrusion of obscuring and distorting images and analogies projected out of man's self-analysis and self-understanding. However, the symbolic denotations must be translated back into the concrete structures of our personal relations with God in order to maintain contact

Third, contrapuntal interpretation must attend to the framework of thought which is derived from the biblical subject matter, which is Christ. This biblical framework of thought goes beyond the closed coherence of the grammatico-syntactical sense of Scripture. This is because without an objective reference the language of Scripture would be meaningless. Therefore, the internal coherence of Scripture depends on a higher level of meaning beyond itself. Otherwise, as in point two above, we would have unscientific distortion, violence, and the imposition of oblique or mythological meanings to the language of Scripture.[1]

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with reality (*Theological Science*, 310; also *Transformation and Convergence*, 252).

[1]*Reality and Evangelical Theology*, 113-117. Like Kierkegaard, Torrance suggests that theology must make a leap beyond the logic suited to conceptual abstractions. Theology deals with dynamic actuality on both the natural and absolute levels (*Theological Science*, 141-280; Klinefelter, 125-126). For Torrance, Carl Henry errs by viewing revelation as giving truths about God rather than God's self-revealing; and by viewing God's act as liberals do, as external to God (*Reality and Evangelical Theology*, 19). Henry writes: "Whoever calls for a higher logic must preserve the existing laws of logic to escape pleading the cause of illogical nonsense" (Henry, 3:229). If the law of contradiction is irrelevant then God and the not-God, the divine and the demonic, cannot be distinguished (2:60). For Morrison, Henry misreads Torrance who has a less explicit understanding of the logos structure of being and the law of contradiction (Morrison, "Thomas Forsyth Torrance's Critique, 62-63). For Nash, if God has a logic all His own, no criteria can exist to distinguish between Yahweh and Satan. "If God Himself cannot reveal timeless truths or universally valid information to us, what leads Torrance to think that he can?" (Nash, 94-95).

Therefore, scientific interpretation starts where linguistic and theological forms are matched to give anticipatory glimpses or conceptions of objective patterns of truth. Then an initial interpretive framework (transparent medium, disclosure model), which will be progressively revised and deepened, is developed (not logically but "contrapuntally") as a guide to further interpretation.[1] This involves a methodological movement from Scripture to Christ and back to Scripture.

This contrapuntal movement involves revision of concepts in theology "on the basis of the biblical revelation."[2] "Interpretation and theological understanding must keep within the semantic scope of the Scripture."[3] However, this semantic scope of biblical revelation is constituted by the material revelation of Christ.

> It is certainly clear that in any serious theological study of the holy Scriptures we cannot operate without concepts, but since they have to be natural to the material content of God's self-revelation to us [that is Christ] in and through the Scriptures, we have to develop them as we go along and work them into an interpretive framework for continuously deepening exegesis and interpretation.[4]

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[1]*Reality and Evangelical Theology,* 117-118.

[2]Ibid., 69.

[3]Ibid., 121.

[4]Ibid., 70-71. Biblically derived concepts "must be constantly submitted to critical clarification and revision

Fourth, scientific contrapuntal interpretation must attend to the canon or standard of truth which is primarily God. Thus, only in a secondary sense is there a rule of faith, basic truths, or canonical doctrines which judge interpretations.[1] Even Scripture is only secondarily a rule of faith or "formal method of verification."[2]

> The ultimate criterion to which appeal is to be made is the truth itself, that Truth independent of themselves to which the Holy Scriptures direct us and to which they themselves are subject.[3]

Torrance explains this principle further to mean that Scripture interpretation "cannot be established or defended simply by appealing to biblical texts or passages or even biblical concepts."[4]

> Biblical statements are to be treated, not as containing or embodying the Truth of God in themselves, but as pointing, under the leading of

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in the light of the realities that become disclosed to us through the Scriptures. . . . Our concepts are to be transparent, open structures of thought, forged under the impact of divine revelation in the Scriptures" (ibid.).

[1]Ibid., 118-120.

[2]"The *formal method of verification* of theological statements is in accordance with the steps actually taken in learning and knowing the Truth, that is, through conformity to the biblical revelation as it has reached us in the Church and within it through conformity to Jesus Christ himself as the Truth of God for us" (*Theological Science,* 193).

[3]*Reality and Evangelical Theology,* 119.

[4]Ibid., 119.

> the Spirit of Truth, to Jesus Christ himself who is the Truth.[1]

Torrance's view of relations between biblical statements and the truth of God seems to be ambiguous[2] with regard to the existence of a discrepancy between them. On the one hand, the discrepancy between the ultimate Truth of God and the truth of theological statements is bridged in Jesus Christ. This is because Christ is apprehended by us on the human side of the discrepancy between theology and the ultimate Truth of God.[3] On the other hand, a

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[1]Ibid., 119.

[2]Langford notes that Torrance does not adequately show the nature of biblical revelation. He needs to develop his biblical hermeneutic so as to adequately integrate dogmatic work with scriptural exegesis (Langford, 162). Torrance recognizes the need such elucidation (*Theological Science,* vii; Langford, 162-163). Langford argues that if Scripture interpretation is guided by an encounter with God this provides a base for theology in historical assessment/validation (Langford, 163; also 164; *Theological Science,* 204). For Ray Anderson, Scripture is one pole of transcendence which participates in revelation. This is not a pure Act united tenuously with humanity, but the Word of God which has entered into real human history where the verbal/written response becomes part of the transcendent act *itself* (Ray Anderson, *Historical Transcendence and the Reality of God: A Christological Critique* [Grand Rapids, MI: Eerdmans, 1975], 213-214). Morrison comments that after Anderson's comments, Torrance has sought to unfold his thinking about and from Scripture and hermeneutics. However, there remains a gap in the field of relations in Torrance's unitary theology (Morrison, "Thomas Forsyth Torrance's Critique," 67-68).

[3]*Theological Science,* 185. "In the Incarnation the ultimate Truth meets us on this side of the discrepancy . . . accessible and amenable to our thinking and our

discrepancy seems to remain between all theological statements--even in Scripture, and the ultimate Truth of God.[1] "For a true statement to serve the truth of being, it must fall short of it, and be revisable in the light of it."[2] As a result, theology must decide "what [in

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statements. . . . The discrepancy between theological statements and the reality to which they refer has been overcome. . . . It is in and through Christological thinking that we can probe deeply into the referring back (i.e. the analogic) of our statements to the Reality of God" (ibid., 186-187).

[1]"By claiming to refer to the ultimate Truth of God our theological statements are thereby positing or acknowledging a discrepancy . . . between themselves as statements and the ultimate Truth" (ibid., 185). The Truth of God retains essential mystery in the midst of revelation. The truth of theological statements are to be found in their relation to the realities they signify. Theology serves the truth over which it has no control (*Reality and Evangelical Theology,* 127, 137-151).

[2]*Reality and Evangelical Theology,* 66. For Torrance, "All the answers we formulate are revisable, for their truth does not lie in themselves but in the realities to which they refer" (*Christian Theology and Scientific Culture,* 116). Therefore, "genuine understanding begins where biblical statements leave off" (*Reality and Evangelical Theology,* 68). See Torrance's "Truth and Authority in the Church," in *Transformation and Convergence,* 303-332; *Reality and Evangelical Theology,* 135-156; "The Stratification of Truth," in *Reality and Scientific Theology,* 131-159. Langford discusses the problem of truth and the self-objectification of God in the Christ-encounter and Word event. Torrance asserts the necessity of Scripture, yet as a disposable medium, he cuts it away from the self-disclosure of God in the world (Langford, 155-170). For Torrance: all statements should be relativized by the truth (*Reality and Evangelical Theology,* 156) which involves non-observable imageless relations inherent in the field of God's interaction with the world through Christ. Harink argues that "there is no indication from this that the

Scripture] is finally irrelevant overtone and what is essential to the real meaning intended."[1] Nevertheless, Torrance does not regard this as a compromise of Scripture authority because he regards this view of truth as "developed from the Holy Scriptures"[2] in both Old and New Testaments.[3] The next section will explore further the influence of Scripture on Torrance's model in terms of the use of historical science in theology.

Use of historical science

The influence of Scripture on the nature of Torrance's model for the use of science in theology is evident in his description of the use of historical science in the study of Scripture.[4] The use of historical science illustrates further the contrapuntal study of Christ and Scripture which was discussed in the previous section. This is evident in

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Scriptures and history have a primary role in shaping concepts" (Harink, 118).

[1]*Reality and Evangelical Theology,* 115. This is since language has a disparateness, discrepancy, and inadequacy which is essential to its function as a precise sign of the truth (ibid., 66).

[2]Ibid., 123.

[3]Ibid., 124.

[4]See section on Dialogical Use of Historical Science below in this chapter.

the fact that Torrance makes use of historical science at three levels of Scripture interpretation.

The three levels of Scripture interpretation are: (1) the level of subject-object relations between interpreters and the biblical texts;[1] (2) the intermediate level of the witness of Scripture to the fact and meaning of Christ;[2] and (3) the ground level of the apprehension of God in the person of Christ. Torrance's description of the first level (interpreter-text) is not obviously Christological. However it is influenced by his interpretation of the witness of Scripture to Christ at the second level. This in turn is influenced by the nature of Christology at the third level.

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[1]*Theological Science,* 326. The first level of the use of historical science involves interpreting the historical documents of the Christian Faith. Here we work within a duality or subject-object relation of ourselves and the texts (ibid.).

[2]Ibid., 326-327. The second level involves the witness of the human subjects who wrote Scripture to realities beyond themselves (ibid.). Torrance refashions Hume's distinction without dichotomy between statements referring to "relations of ideas" and "matters of fact," that is between coherence-statements and existence-statements (ibid., 165; see *Theology in Reconstruction,* 52-61). He follows the study of Hume in G. E. Moore's *Philosophical Studies* (New York: Harcourt Brace, 1922), 160. Harink praises Torrance's insistence on the referential nature of language as a valuable alternative to overemphasis on propositional truth. He also agrees with Torrance's resistance of any logical straitjacketing of theology (Harink, 133). See P. T. Geach, *Reference and Generality* (Ithaca, NY: Cornell University Press, 1980); Richard B. Miller, "The Reference of 'God': Causal Theory Of Reference, Existence of God," *Faith and Philosophy* 3 (1986): 3-15.

Torrance comments that, on the third level, "we meet with God Himself in the person of Jesus Christ."[1] However, the duality inherent in the divine-human dimensions of Christ (level three) is the basis of the subject-object relation (level one), and the fact-meaning relation (level two).[2] The Christological nature of the second "intermediate level" and the third "ground level" explains

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[1]*Theological Science,* 327. Existence-statements interpenetrate with coherence-statements or both would be meaningless (ibid.). Theological statements are kerygmatic existence statements and didactic coherence statements. They collide with natural forms of speaking and involve a change in logic and language as in scientific statements. They are true (infallible) but inconclusive (fallible) for they are divine yet refracted through humanity (ibid., 51, 149, 161-186, 190-191, 246, 279, 511). Langford asks how theological statements may be true if they are not conclusive; or how the truth of God retains its validity if refracted through human thought (Langford, 161). Torrance proposes correspondence between the Word and Act of God. However, since referential relations remain contingent, they direct us back to a divine and infinitely transcendent source (*Theological Science,* 244). In *analogia fidei* we refer everything to God and nothing to ourselves. This involves a radical questioning of forms of reference and helps ensure that our statements serve the Word of God and are not substitutes for it (ibid.). For Harink, Torrance "is simply drawing out the logical conclusion of Barth's own peculiar fideistic apologetic, in which the inner rationality of theology is the Christian's refutation of criticism" (Harink, 130). Klinefelter holds that "this linguistic problem is of course not unique to Torrance's position, or even to theology for that matter, but it nevertheless remains a genuine difficulty for any serious philosophical theology." Also Torrance's position reflects Wittgenstein's analysis (Klinefelter, 122, n. 27).

[2]*Theological Science,* 327. "It is upon this basic level and the nature of the duality inherent in it that the character and significance of the other levels depend" (ibid.).

why Torrance modifies the traditional historical-critical method into the historical-theological interpretation of Scripture.[1]

In summary, Torrance's model for the use of science is influenced by his view of Bibliology. However, his view of Bibliology is in turn controlled by his view of Christology. He emphasizes that Christ is the material source and norm of theology and Scripture is the formal source and norm. There seems to be a possible incoherence here among some of Torrance's statements. If, as Torrance writes, Christ is a formal as well as a material norm, why is Scripture not also a formal as well as a material norm? Torrance's view of God as revealed in Christ in Scripture could be understood as pointing in this direction.

The control of Christology over Torrance's model for the use of science in theology is evident in his description of scientific contrapuntal study of Christ and Scripture. This method gives attention to a Christological scope, ground, order, framework, subject matter, and cannon or

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[1]Ibid., 326-327. Torrance suggests that often the result of historical-critical method is predetermined because it "is not carried far enough through radical questioning into the preconceptions controlling its deployment, and above all into the axiomatic assumption that at all stages it is man's knowing of phenomena which gives them the intelligible shape and structure . . . [and] meaning" (*Transformation and Convergence,* 246-247).

standard of truth in relation to the interpretation of Scripture. In this way Torrance maintains a degree of coherence between the influence of Christology and the influence of Bibliology on his model for the use of science in theology.

There seems, however, to be a degree of incoherence in Torrance's contrapuntal method. On the one hand, he suggests that interpretations of Christ and Scripture are to be revised in the light of each other. On the other hand, his model for the influence of Christ and Scripture on the use of science in theology seems to give methodological priority to Christ over Scripture. This priority is based on the presupposition of a discrepancy between the truth of God and of Scripture which is bridged and yet not bridged in Christ. Thus Scripture falls short of revelation in Christ, and its "irrelevant overtone" is revisable in the light of Christ. The emphasis on Christ seems to compromise Torrance's view that his approach is developed from the Scripture itself. Torrance himself seems to recognize the potential incoherence here when he refers to this approach as not logical but contrapuntal.

The Christological nature of Torrance's model is evident also in the use of historical science to clarify Scripture interpretation in terms of relations (1) between

interpreter and text, (2) between inspired writers and Christ, and (3) between interpreter and Christ. It is not clear, however, how historical science impacts the relations described above. In fact its use seems controlled by Christology. This probably explains Torrance's reference to the historical study of Scripture as historical-theological rather than historical-critical.

The next section of this dissertation describes the nature of Torrance's model for the use of science in theology in terms of the influence of Natural Theology on his model for his use of science in theology. It also evaluates the coherence of Torrance's descriptions of the influence of Christology, Bibliology, and Natural Theology.

Natural Theology

That Natural Theology is an element in Torrance's model for the use of science in theology is evident in that he expands his definition of theology to include Natural Theology. Theology is the science of the knowledge of God in Christ in Scripture and in the world. Theology "operates on the ground of God's actual self-revelation to us in and through the created order of the world."[1]

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[1]*Christian Theology and Scientific Culture,* 115. For Torrance, positive theology is grounded in the presupposition of revelation (ibid.).

The influence of Natural Theology on Torrance's model for the use of science is explored below in terms of (1) the relations between natural and positive theology, and (2) the relations of Natural Theology and the other sciences.

Natural and positive theology

The nature of Torrance's model for the use of science in theology is evident in his discussion of relations between natural and positive theology. On the one hand, from a methodological perspective, Torrance rejects traditional or independent Natural Theology as he excludes the methodology of natural science.[1] This is because Natural Theology as a foundation to positive theology is a hindrance to authentic theology. In addition, Natural Theology as a criterion for evaluating the content of revelation is also a hindrance.[2]

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[1]*Theological Science,* 104.

[2]This is a *methodological* not metaphysical rejection of natural theology (ibid., 103). See "The Status of Natural Theology," in *Reality and Scientific Theology,* 32-63; "The Transformation of Natural Theology," in *Ground and Grammar,* 75-109. "What scientific theology rejects is the attempt to treat 'natural theology' as a foundation upon which positive theology can be made to rest, or to use it as a criterion by which to assess the content of what we apprehend through divine 'revelation'" (*Theological Science,* 104). "[Traditional] natural theology may offer the greatest hindrance to natural science and to theology alike" (ibid., 102). Natural science starts from Godless premises and moves opposite to theology in accordance with its subject-matter. However, traditional/independent Natural Theology

On the other hand, from a metaphysical/factual point of view, Torrance does not reject that kind of Natural Theology which he regards as authentic.[1] In fact, he suggests that a revised conception of Natural Theology (within positive theology) is necessary to facilitate the use of science as a dialogue partner of positive theology.[2] For Torrance, this is a philosophical dialogue. It is in the "dialogue" and "overlap" "between a philosophy of theological science and a philosophy of natural science" "that a modern natural theology finds its place."[3]

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starts from the same premises and phenomena as natural science and seeks to move toward God. This conflicts with natural science and pure theology, proving to be a source of confusion to both if not actual obstacle in their progress (ibid., 103). The world is studied in different ways by Natural Theology and natural science (*Transformation and Convergence,* 282).

[1]*Theological Science,* 103. Harink wrongly concludes that Torrance rejects Natural Theology altogether (Harink, 123). For Torrance, justification by Grace does mean the metaphysical denial of natural goodness, Natural Theology, or natural man. However, it does mean that man is set upon a wholly new basis in Grace. Thus the questioning of Natural Theology is grounded upon the event of divine grace as relativizing it or excluding it, at least as far as positive approach to God or positive theological inquiry is concerned *(Theological Science,* 102-103).

[2]See *Ground and Grammar,* 7; and *Christian Theology and Scientific Culture,* 27.

[3]*Space, Time and Resurrection,* 23, n. 36.

Natural theology and other sciences

Clearly, Torrance's model for the use of science is influenced by the place/nature of Natural Theology in his conception of revealed/positive theology. He suggests that

> a closer relation must be established between natural theology and revealed theology. . . . Natural theology must be brought within the heart of positive theology, where of course its structure will change, for then physical statements and theological statements will be intimately correlated. This means that positive theology will change also, for it will have to be pursued in indissoluble relation with the space-time structures of the creation.[1]

Torrance's Natural Theology calls for an amazingly comprehensive use of each science in theology.

> Theological statements must be coordinated . . . with *each* science that is concerned with the examination and interpretation of this-worldly experience and knowledge.[2]

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[1]*Transformation and Convergence,* 281-282. Natural Theology must be undertaken in an integrated unity with positive theology where it spells out the inner logic of the knowledge of God (*Space, Time and Incarnation,* 69-70). For Torrance, this is what Barth did (*Space, Time and Resurrection,* x; also *Transformation and Convergence,* 285-301). For Klinefelter, Torrance regards irrationality as rational in theology. Thus theology seems to operate quite independently of philosophy or swallows it up in Natural Theology. This is similar to positivists and reductive naturalists who hold canons of verification and meaning which exclude theology from significance or transform its statements into psychological, sociological, or anthropological utterances (Klinefelter, 130).

[2]*Space, Time and Incarnation,* 90, emphasis mine. This is in addition to coordination with non-scientific ordinary experience (ibid., 90).

In fact, for Torrance, Natural Theology has its place in the connection between science and theology.

> There is a necessary and inescapable connection between theological concepts and physical concepts, spiritual and natural concepts, positive and natural theology, or rather between theological science and natural science, for it is in that connection that the changed status of natural theology has its place.[1]

As such, Natural Theology guides the coordination of science and theology on the different levels of scientific thought.[2] Authentic theology (even though grounded in God) must have empirical correlates in the world "consistent with the multi-leveled structures of the universe as they become revealed to our scientific inquiry."[3]

Theology, on different levels, is open upward to God but coordinated downward through some empirical correlations in Natural Theology.[4] The coordination of science and

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[1]*Reality and Scientific Theology,* 69.

[2]This is because "no level of thought and no science can be a completely closed system. . . . The various sciences can be coordinated meaningfully in levels in which they can best serve each other in the whole of our knowledge of God and of the world He has made" (*Space, Time and Incarnation,* 90).

[3]*Transformation and Convergence,* 258. "Theological statements are properly . . . grounded beyond in the transcendent reality of the living and loving God who is the Creator and Sustainer of the whole universe of space and time and the Source of its contingent rationality" (ibid., 258). See *Ground and Grammar,* 13-14.

[4]*Space, Time and Incarnation,* 89-90. "That is why

theology is based on an "inevitable overlap" between the inquiries of science and theology.[1] Since "theological science and natural science are both at work in the same world,"[2] "we cannot think and speak adequately or worthily of God apart from the whole range of scientific inquiry."[3]

In harmony with the inclusion of Natural Theology within a Christological positive theology, Torrance proposes that science may be used to test the empirical correlates of theology, but only as subject to decisions made in harmony with Christological theological method.[4] This use of

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theological formulations cannot be without their empirical correlates. This does not mean that each theological statement must have such a correlate, but that it must be embodied in a system in which some basic statements do have correlates" (ibid., 89-90).

[1]*Divine and Contingent Order,* 1-2.

[2]*Space, Time and Incarnation,* viii. Theology and science both "are seeking understanding within the rational connections and regularities of space and time where they pursue their respective inquiries and let their thinking serve the reality into which they seek to inquire (ibid., viii).

[3]*Reality and Scientific Theology,* 67. Through science "God-given intelligibilities of the created world are increasingly disclosed to us . . . because the *God* whom we seek to know is the God who created the world and is the Lord of all things visible as well as invisible" (ibid., 67). "We cannot step outside the relationship to the rationality of the universe in which we find ourselves without stepping outside of rationality altogether" (*Space, Time and Incarnation,* 53; see also *Transformation and Convergence,* 264).

[4]Theology must examine the empirical correlates of its

science in theology is facilitated by the fact that evangelical or Christological theology and other sciences share the same rationality.[1] Torrance discusses his

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basic statements in discussion with the other sciences. It must test those correlates for their truth or falsity in such a way as not to allow the real decision (in Gödel's sense) to be taken outside the organized structures and topological connections within which it must operate. While some sort of 'dual control' (in Polanyi's sense) is envisaged here, the final decision must be taken within the organizing principles of the higher level of theology over other sciences (*Space, Time and Incarnation,* 90). Theology "can be pursued by men, who are by themselves constituents of the created order, only by thinking the levels of the created and the creative orders conjunctively together" (*Transformation and Convergence,* 257-258). See also ibid., 258; *Ground and Grammar,* 13-14.

[1]Evangelical theology avoids extreme Cartesian dualism (Kant) and romantic irrationality (Schleiermacher, Bultmann, Tillich) (*Theological Science,* 26ff.; see also *Reality and Evangelical Theology,* 9). Ronald Thiemann claims that Torrance rejects the reciprocal relation of subject and object which is characteristic of rationality in science. This bypasses our normal mediating conceptual frame by equivocal use of the term knowledge (Thiemann, *Revelation and Theology: The Gospel as Narrated Promise.* Ford argues that Thiemann is unfair to Torrance's complete theology, but is right about the inadequacy of his appeal to intuition and drawing too tightly the lines between science and theology (Ford, 278-279). For Morrison, Thiemann shows how Torrance transcendentalizes the Word above history. Morrison faults Torrance's use of Barth and sees Hans Frei as a Barthian with a greater realization of the role of textuality and narrative in God's self-disclosure (John Morrison, 367-369, 428). For Atkinson, while Torrance rightly demands freedom from alien criteria he does not propose an adequate mode of verification (Atkinson, 256). Langford argues that "the criteria are too general, too versatile in their application to be of much help" (Langford, 165). For Klinefelter, the connection of the ontological status of theological truth with ordinary rationality is minimal and unfalsifiable (*Theological Science,* 237, 241; Klinefelter, 128-129). Following Lonergan, Marcum makes a similar criticism

theological epistemology in relation to the epistemology of the natural sciences. In both, epistemology involves exposition of the content of knowledge, which in the case of Torrance's theology is Christological.[1]

Torrance refuses to separate Christological theology from the other sciences. He insists that theology goes beyond but not without natural science. This is because the world is not only contingent away from God but also is contingent toward God. In "contingence away from God" the world "is the preserve of natural science." However, in "contingence on God" the world points beyond "the limits that would otherwise satisfy natural science." Therefore, "genuine interaction between theological and natural science cannot but be helpful to both."[2]

(Marcum, 49-53). In contrast, Bower argues that the search for empirical falsifiability is inappropriate to the divine Object. If theology is to be done scientifically, it must resist the temptation to seek external rational justification (Bower, 63).

[1]"In the nature of the case a true and adequate account of theological epistemology cannot be gained apart from substantial exposition of the content of the knowledge of God, and the knowledge of man and the world as creatures of God" (*Theological Science,* 10-11). In contrast, autonomous reason begins with epistemology, turns on itself and prescribes cannons of meaning and truth which bear little relation to objective reality (ibid., 26, n. 1). Klinefelter refers to this type of epistemology as "objectivism" (Klinefelter, 118-119).

[2]*Divine and Contingent Order,* 60. On contingency as the science-theology bridge see ibid., 69-72. Torrance presents a paradox of overlap as well as divergence of

In summary, on the one hand, Torrance's model for the use of science in theology is influenced by the definition of theology as the science of the knowledge of God in Christ in Scripture in the world. His view of the limits of the use of science in theology is influenced by the tension between rejection and acceptance of Natural Theology. Nevertheless, the place of Natural Theology within positive theology facilitates the use of science in theology.

On the other hand, the control of Christology over the use of science is evident in Torrance's inclusion of Natural Theology into his Christological theology. In his Natural Theology he submits empirical correlates to the control of the higher Christological levels of theology. This means that theology is open upward to God in Christ and coordinated downward to empirical reality in the world. In this way Torrance presents a coherent relationship between the influence of Christology, Bibliology, and Natural theology on his model for the use of science in theology.

Nevertheless, there seems to be some incoherence in this matter. On the one hand, Torrance rejects external Natural Theology as foundation or criterion for positive theology. On the other hand, he included Natural Theology

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science and theology which is bridged by dialogue (*Space, Time and Resurrection,* 180; *Reality and Evangelical Theology,* 30).

within positive theology as the basis for philosophical dialogue with other sciences. This Natural Theology guides intimate correlation of physical and theological statements and concepts, and a necessary/inescapable connection between natural and theological science on all levels. However, Torrance does not make it clear how Scripture remains normative in this Christological openness to God and coordination with empirical correlates. Also, it remains unclear how the Christological content of theological knowledge is related to the knowledge content of Scripture. The next section describes how the relations of the Christological and the Natural Theology levels of truth indicate the Christological nature of Torrance's model for the use of science in theology.

Truth Hierarchy of Christ, Scripture, and Nature

The nature of Torrance's model for the use of science in theology may be further clarified in terms of his concept of the hierarchy of the truth of Christ (Christology) above the truth of Scripture (Bibliology), which is, in turn, above the truth of nature (Natural Theology).

On the one hand, there is a use of science in theology because all truth is God's truth. This is because Christ-centered revelation comes within the created order of the

spatiotemporal world studied by science. Thus true theological knowledge is inevitably coordinated to the contingent objectivities and intelligibilities of that world as they are discovered by science.[1]

On the other hand, the use of science in theology is complicated and limited by Torrance's proposition that the structure of truth involves a hierarchy of Christ over Scripture over nature. Thus, created contingent objectivities "must have an open or free reference to God, for knowledge of God and speech about him may never be dragged down and subordinated to the truths of created being."[2] This means that "each formal system is open

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[1]*Reality and Evangelical Theology,* 152. These "have a critical significance for our knowledge and speech about God, for they provide the consistent structure of order on which our human concepts and statements rely in significant and truthful communication with one another, and as such they constitute the given medium of the self-revelation and self-articulation of God. . . . Hence theological concepts and statements may have reference to God only as they have a co-reference to this world of contingent objectivity and intelligibility" (ibid., 152-153).

[2]Ibid., 152. "Insofar as theological concepts and statements signify the truth of created being . . . they fall under the constraint of that truth and must be obedient to it, otherwise they would not signify rightly or truthfully. But insofar as that created truth refers beyond itself to the uncreated truth of God, theological concepts and statements are summoned to assent to that transcendent reference in meeting their obligation toward it" (ibid., 153).

upwards, not downwards, and therefore no level of thought can be accounted for by being reduced downwards."[1]

This implies a theological hierarchy of Christ over Scripture over nature. For Torrance, the inversion of the hierarchic structure of the levels of truth (such as nature over Scripture over Christ) would be a perverted form of authoritarianism. This would be a subordination of the ultimate Truth to the truths and statements of the creature, imposing the preconceived patterns of human devising or self-understanding upon God's self-revelation, clamping down our own independent formulations upon the substance of Christian faith. In other words, this would be an illegitimate subordination of the ultimate truth to the human truth of science.[2]

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[1]*Space, Time and Incarnation,* 89.

[2]*Reality and Evangelical Theology,* 154, 156. Torrance claims that theological statements are to be considered only in relation to the ultimate Truth of God, which is their primary reference, and in relation to their consistency with other human statements about God which is their secondary reference (*Theological Science,* 191). This issue involves a double problem of theo-logic: the relation of speech to being, and the relation of speech to God's being. Jesus as the logic of God requires a *four-dimensional logic* or a *logic of verbs* rather than symbolic and mathematical logic. The logic of Jesus is also community and historical logic. Theological thinking must not graft abstract doctrines and truths onto the Church, society, state, or human nature as the ground of their reality. Jesus is the Reality in whom all theological truths inhere and cohere (ibid., 204-222, 326-327; "The Logic and Analogic of Biblical and Theological Statements in the Greek Fathers," in *Theology in*

Torrance also rejects a flattening out of the levels of Christ, Scripture, and nature in such a way that God and world are confused.

> There can be no resolving of divine transcendence into this-worldly transcendence or any merging of the divine reality and this-worldly reality on the same horizontal level, even if that be regarded as an inclined plane.[1]

Nevertheless, there is an intersection of God and the world and therefore of science and theology.

> God's interaction with the world He has made maintains a proper dualism between them. . . . [However,] in Jesus Christ the divine reality intersects this-worldly reality like an axis.[2]

Reconstruction, 30-45).

[1]*Space, Time and Incarnation,* 71-72. Torrance warns that this overlap involves danger of reading the worldly into the divine (*Reality and Scientific Theology,* 70-71). Theology involves an overlap of the historically accessible with the inaccessible. Its realities and resulting concepts cannot be explained in terms of previous knowledge and language. Far more is revealed than we can specify. Scientific theology reaches beyond ordinary notions of space and time and may not be correlated unambiguously with the ordinary language. However, this makes every possible point of interaction with ordinary experience important. Apart from that overlap our knowledge would be without relevance or applicability or distinction from imagination and invention. Apart from such an overlap the divine realities could not be apprehended at all (*Theological Science,* 293-294).

[2]*Space, Time and Incarnation,* 71. Science and theology sustain objectivity and truth differently (*Christian Theology and Scientific Culture,* 114). However, the language of creation and revelation is not to be split with one given an improper ascendency (ibid., 126; see 129-144. On the book of nature and the book of God, see ibid., 122). "If our language about God who cannot be observed and our

In summary, the Christological nature of Torrance's model for the use of science in theology is evident in four aspects of his model. First, the use of formal methods of science and the use of special sciences are influenced by Torrance's definition of theology in terms of Christology. Torrance explains that there is no formal "Science" in isolation from material "sciences." However, there is a formal "Science" that manifests itself in every science including theological "science."

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language about the world which can be observed, must not be confused, it is because they intersect at decisive points, and not because they are merely the obverse of each other or because they are merely parallel to one another" (*Space, Time and Incarnation,* 71-72; also 75). For Torrance, "dualism" seems to mean duality (ibid., 71). He rejects the dualist theology in which God is thought of as separated from the world of nature and history by deistic distance ("The Problem of Natural Theology," 121; see Klinefelter, 134). This "gave rise to the dichotomy between the theoretical and empirical components in knowledge which pure science has had to reject but which still lives on in the cultural split between the sciences and the humanities" (*Space, Time and Resurrection,* 40). He traces the split to "the narrow-minded rationalism of the Enlightenment" (*The Christian Frame of Mind,* vii). See also ibid., 88; *Ground and Grammar,* 15-43; *God and Rationality,* 103-111. Torrance has also written on the effect of dualism on biblical interpretation and theological statements (*Ground and Grammar,* 28-41); on Israel as a nondualistic civilization (*The Mediation of Christ* [Grand Rapids, MI: Eerdmans, 1983], 16-46); on the process of overcoming of dualism in classical Christianity and modern science (*Ground and Grammar,* 44-45); and on the unification of empirical and theoretical factors of knowledge (*Reality and Evangelical Theology,* 10).

The following questions arise from Torrance's model. With regard to Torrance's view of objective theological science it may be asked: What really is the object of theology? Is it all or part of the following?: God in Christ in Scripture in the world. With regard to formal and material norms; If Christ is a formal and material norm, why is Scripture not also a formal as well as a material norm?

Second, the influence of the study of Scripture (as source and norm of theology and its use of science) is contrapuntal with the study of Christ (who is also source and norm) so that interpretations of Scripture and Christ may be revised in the light of each other. However, this radically Christological model also controls the three levels of the use of historical science to clarify relations of interpreter, Scripture, and Christ.

On the one hand, Torrance suggests that interpretations of Christ and Scripture are to be revised in the light of each other. On the other hand, his model for the influence of Christ and Scripture on the use of science in theology seems to give methodological priority to Christ over Scripture. This possible incoherence is based on the presupposition of a discrepancy between the truth of God and of Scripture which is bridged and yet not bridged in Christ. Thus Scripture falls short of revelation in Christ and its

"irrelevant overtone" is revisable in the light of Christ. Does this not add up to a revision of Scripture revelation in light of an interpretation of Christ? This seems to make some interpretations of Christ to be a more authentic revelation than is Scripture.

Third, the influence of Natural Theology on the use of science in theology is also Christological. There is a relationship between authentic Natural Theology and positive Christological theology which facilitates the use of science in theology. Torrance includes Natural Theology in a Christological framework so its empirical correlates are submitted to the Christological and Bibliological levels of theology. Ultimately, because of the revision of Scripture in light of Christology, the control of Natural Theology is Christological.

Fourth, this means that theology is open upward to God in Christ and coordinated downward to empirical reality in the world. The Christological nature of Torrance's model for use of science in theology is evident in the hierarchy of the levels of truth in Christ over Scripture and over nature. Torrance resists the inversion or flattening out of this hierarchy in any way because he argues that God in Christ would then be subjected to human truth and science or confused with the world.

However, as noted in connection with point two above, Torrance has not been able to show how he can avoid subordinating God to human interpretation unless God has revealed some standard for such interpretations. On the one hand, Torrance seems to claim that the standard is the objective revelation of Christ through and yet beyond Scripture. However, on the other hand, in order to judge between various interpretations of Christ one must add to the standard of Christ some authoritative interpretations such as those developed within the ongoing history of the Christian Church.[1] It is not always clear if Torrance holds to this position. Sometimes he seems to validate the Scripture principle while referring to the community of interpretation.[2]

The Christological nature of Torrance's model for the use of formal principles of science in theological science has now been surveyed. This has been a general survey of Torrance's model in terms of his presuppositions about the nature of science and the nature of theology. In his Christological theological science Christology is the major

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[1]*Reality and Evangelical Theology,* 10; also *Reality and Scientific Theology,* 85; and "The Social Coefficient of Knowledge," in ibid., 98-130; *Theological Science,* 191-192, 199-200.

[2]Ibid., 160-161, 192. See earlier section in this chapter on Sources and Norms.

influence on his model (in contrast to his Bibliology and Natural Theology). In the next section, the dialogical nature of his model for the use of science in theology is presented. This will involve a more detailed analysis of his model in terms of specific uses for scientific methods and scientific theories in theology.

A Dialogical Model for the Use of Science

Previous sections of this chapter have demonstrated that Torrance's model for the use of science in theology is not only responsive to the postmodern shift but it is also Christological. This section of this chapter addresses the following questions: What is the nature of Torrance's model in terms of his proposal of specific uses of scientific method and scientific theory in theology? What is the extent of the use of science in his model?

Torrance explicitly describes his model for theology as dialogical.[1]

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[1]For Torrance, Christological theology is by definition scientific, dialogical encounter with revelation (ibid., 138, 146, 125-161; *Christian Theology and Scientific Culture,* 117-119). However, this section focuses on Torrance's dialogical model for reconciliation between science and theology (Bower, 3, 59, 64). The scientific theological dialogue with other sciences is also apologetic dialogue (*Divine and Contingent Order,* 1-2; *Theological Science,* xii, xvii, 56; Klinefelter, 118).

> Theological inquiry . . . must get inside and operate within a dialogical relation to the Object, or rather it must allow the Object to break through the monologue of reason with itself . . . and force it into a real dialogue.[1]

This dialogical nature of his model will be presented here in terms of the use of science as a dialogue partner with theology.[2] This will involve descriptions of (1) the basic nature of the dialogical use of science, (2) the dialogical uses of scientific method, and (3) the dialogical uses of scientific theory.[3]

The Basic Nature of the Model

Torrance's dialogical model for the use of science in theology highlights differences as well as common ground

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[1]*Reality and Evangelical Theology,* 10.

[2]See *Ground and Grammar,* 7; and *Christian Theology and Scientific Culture,* 27.

[3]Torrance does not list all the uses of science in theology in one place. The list presented below is gleaned from my extensive reading of Torrance but does not claim to be exhaustive. This distinction of method and theory is a matter of convenience and convention since method is always theory laden and theory is inevitably influenced by method. See David Lyon, "Valuing in Social Science: Post-empiricism and Christian Responses," *Christian Scholars Review* 12 (1983): 324-338. For Torrance, authentic theology knows "the impossibility of separating out the way in which knowledge arises from the actual knowledge that it attains" (*Theological Science,* 10-11). The recent changes in epistemology involve the rediscovered unity of form and being, structure and substance, and theoretical and empirical ingredients in science and theology (*Transformation and Convergence,* 250).

between science and theology as dialogue partners. Thus, the use of science in "authentic dialogue" between science and theology involves a "philosophy of science" and a "philosophy of theology" which recognize their different types of evidences and "framework[s] of knowledge."[1]

This means that in Torrance's dialogical model there is both a limit to the use of science and an extensive use of science as dialogue partner with theology. The dialogical nature of the limits and the extent of the use of science are presented in subsequent sections of this chapter in terms of the historical, natural, and human sciences.

Dialogical Use of Historical Science[2]

Torrance proposes limited dialogical use of historical science in Scripture interpretation based on the differences and the common ground between both disciplines. On the one hand, the use of historical science is in a sense excluded in that Scripture language points beyond its historical

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[1]*Theological Science,* 104-105. "We must learn to give to faith what belongs to faith and to nature what belongs to nature. In this way we must develop a scientific theology, operating on its own proper grounds and with its own distinctive categories determined by the nature of God as known, and developing its own proper *philosophy of science,* the *philosophy of theology*" (emphasis mine) (ibid., 104-105).

[2]See section above on Use of Historical Science.

nature to the truth of God.[1] Torrance also argues that the unique scientific nature of authentic theology (which is a dialogue with God)[2] requires such an exclusion.[3]

On the other hand, theology cannot avoid some dialogical use of historical science.[4] This is because

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[1]*Reality and Evangelical Theology,* 66-71. See Torrance's discussion on the "real text" of Scripture (*God and Rationality,* 150-151). This raises the issue of dualism between history and revelation. (On Bultmann's view and existentialist views of history and Christianity see *Theological Science,* 327-332). On dialogical relation to truth see ibid., 176.

[2]*Theological Science,* 17, 37, 42, 69, 128-138, 163-164, 191, 200, 208, 276, 307-309, 351.

[3]"In claiming to be a science, objective knowledge exhibiting its own grounds and employing its own independent categories, theology thereby excludes the transfer to its own field of the distinctive axioms, postulates and canons that have been forced upon us in other fields of knowledge by the nature of their subject matter, and thereby rejects all alien dogmaticisms" (ibid., 338).

[4]An extended discussion of the relevance of historical science (ibid., 312-337) comes just before Torrance's comment on methodological exclusion of other sciences (ibid., 338). He addresses the *Historie-Geschichte* problem--the temptation to ignore duality by reducing history to nature (materialistic science) or to embrace dualism by idealizing history. He appeals to the *complexity* or duality of the fact of Jesus which "*includes its own interpretation as part of its facticity*" (ibid., 326). The Jesus event continues into the present (ibid., 333-334). For Klinefelter, "inherent duality" of God and world (like Torrance's inexplicable "givenness" of the divine) reflects an inherent dualism in epistemology and ontology (Klinefelter, 121, 131-132). Harink criticizes the idea of a givenness passively modeling the Being and Act of God and mediating an otherwise unmediated revelation. "If theological models *are* the avenue of God's revelation, then certainly, the more passive the mind, the better. But if,

Torrance proposes a non-dulaist, interactionist, creation-incarnation axis[1] where "God and the created universe . . . are mutually affected by each other."[2] Theological dialogue with God in Christ takes place in the same world which is studied by historical science.[3] Therefore, theology must make dialogical use of historical science.

Torrance demonstrates a limited dialogical use of science in theological dialogue with God by incorporating historical science within an "historical-theological" or

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as we hold, theology merely talks *about* avenues of revelation, then there is all kinds of room for imagination, for innovation, for breakdown and reconstruction" (Harink, 133).

[1]*Space, Time and Incarnation,* 30, 71-73, 85; *Theological Science,* 313-326. For example, in Christ, "we are confronted with a logos that has embodied itself in our concrete existence in space and time and cannot be known apart from that embodiment in history. If we are to remain faithful to the fact of Jesus Christ in its integrity and wholeness we cannot allow either side of this duality to be resolved away" (ibid., 326).

[2]*Ground and Grammar,* ix. The unfolding of the orderly connections of the universe under scientific investigation helps develop and express our knowledge of God mediated by his Word (ibid., 6). Harink regards Torrance as close to a genuine notion of interaction of mind and intelligibility but inadequate in distinguishing the natural and the theological mind and in modeling God-world interactions (Harink, 123, 131-134). However, Trook comments that Torrance replaces monism and dualism with a unitary perspective on interrelations within the trinity and between the trinity and creation overcoming dualism horizontally and vertically (Trook, x-xii).

[3]See *Theological Science,* 136.

"theological-historical" method.[1] His dialogical model for the use of historical science in theology is based on the dialogical interaction of the ministry of the Holy Spirit[2] and Christian faith.[3] This leads to improved understanding of the givenness of divine revelation in history.[4]

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[1]Ibid., 324, 326. "Theological inquiry into the person of Jesus Christ must be historico-theological, and historical inquiry into the fact of Jesus Christ must be theologico-historical" (ibid., 326). See earlier section in this chapter on Use of Historical Science.

[2]*Space, Time and Incarnation,* 85. On the Trinitarian structure of theology see *Theology in Reconstruction; Reality and Scientific Theology,* 160-206; *Ground and Grammar,* 146-178; "The Epistemological Relevance of the Holy Spirit," in *God and Rationality,* 165-192.

[3]*Theological Science,* 324-326; *God and Rationality,* 153-156; *Christian Theology and Scientific Culture,* 41-72. Torrance's view of theology as a science is compatible with his view of science as 'faith in search of understanding" (*The Christian Frame of Mind,* 73). For Klinefelter, Torrance defends a sophisticated Barthian fideism (Klinefelter, 128-129). Bower argues that Torrance is accused of fideism by those who want an *a priori* rational basis for theology (Bower, 3, 64). Harink suggests that theology is primarily a rational response to revelation (Harink, 123, 131-134). Ironically, Langford faults Torrance for an overly rationalistic view of faith (Langford, 158, 168-170). Similarly, for Mary Agnew, Torrance "seems to equate the experience of God with cognitive knowledge of Him" and to suggest "that proper methodology is the source of persuasive clarity in theology's presentation of God" (Agnew, 198). See Jerry Gill, review of *Theological Science, Christian Century* 86 (October 29, 1969): 1386.

[4]*Theological Science,* 27-28.

Dialogical Use of Natural and Human Science[1]

For Torrance, the differences between theology and the natural and human sciences necessitates certain limits to the use of science in theology. For him, the same principles concerning natural science and theology may be applied to the issue of the human sciences.[2]

On the one hand, "natural science and scientific theology operate through a methodological exclusion of one another, for by their very nature they move in opposite directions."[3] Therefore, there must be a very careful distinction between the methods of science and theology.[4]

On the other hand, "clearly theology needs *dialogue*

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[1]See sections above on Theology Among the Special Sciences and Natural Theology and Other Sciences.

[2]*Theological Science,* xii. On the lag between natural and social sciences see *Transformation and Convergence,* xiii-xiv.

[3]*Theological Science,* 102. Harink asks: "But if the distinction is so great, how may the two branches [science and theology] even speak to each other?" He is critical of Torrance's answer: "at the level of methodological reflection" (Harink, 13).

[4]"Theological formulations are not explicable, or specifiable, in terms of the laws and operational principles that obtain in the natural sciences, for that would involve a thoroughly unscientific reductionism which, to say the least, would destroy the interrelations between the sciences themselves and rule out of court the ultimate beliefs with which they have to operate" (*Space, Time and Resurrection,* 23).

with natural science."[1] Theology needs dialogue with natural and human science for the same reason it needs dialogue with historical science. Theology has to do with God and His relation to the world and humanity in Christ.[2]

Torrance presents the idea of complementarity as a solution to the tension between his views of the limits and the extent of dialogical use of scientific method in theology. Dialogue involves similarity and difference between science and theology. However, "the more exactly natural science and scientific theology are pursued, the sharper the distinction but the greater the complementarity between them."[3] This complementarity is described in terms of largely "indirect" rather than "direct" comparison and dialogue with theology.[4]

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[1]*Divine and Contingent Order,* 73, emphasis mine. On theological dialogue with science see *Theological Science,* 104-105, 284, 289.

[2]See sections on Theology Among the Special Sciences, Use of Historical Science, Dialogical use of Historical Science, and Dialogical Use of Natural and Human Sciences.

[3]*Theological Science,* 102. "Mutually exclusive ways of knowledge and description are held to be complementary to one another without any possibility of their combination" (ibid., 102). Some scientists find in the theology of Barth a ground for science-theology dialogue/rapprochement. This arises out of the understanding of theology as a science and out of the dedication of the sciences to their proper objects, methods, and grounds (ibid., 289). See chapters 4 and 5.

[4]Ibid., 284-285. However, "some direct comparison is

The dialogical nature of Torrance's model for the use of science in theology has now been presented in terms of the limits and extent of the use of historical, natural and human science. The next section will describe the dialogical nature of Torrance's proposals of specific uses for the method and theory of science in theology.

Dialogical Use of Scientific Method

Torrance's dialogical model for the use of science in theology addresses the issue of similarities and differences between scientific and theological methodology. On the one hand, for Torrance, there is a sense in which the method of the other sciences should not be used in the particular scientific method of theology.[1] On the other hand,

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inevitable and right in so far as the objective facts are within the same creaturely . . . plane but so far as they are not any direct comparison is illegitimate for it would involve serious category mistakes" (ibid., 284-285).

[1]Rather "it must pursue its own distinctive ends in a scientifically rigorous way on its own ground and in accordance with the nature of *its own proper object*" (emphasis mine) (*Space, Time and Incarnation,* viii). Klinefelter has altered for emphasis the following words of Torrance: "What we are concerned with here, then, is not the contribution of the other sciences in any way to the material content of [theology], but with the [theological] results that accrue from rigorous scientific thinking within theology" (*God and Rationality,* 114, quoted in Klinefelter, 120). Klinefelter is critical of Torrance's Barthian views on divine action in the world, truth beyond space-time connections, and dualist, timeless, word-event encounter with God in Christ (ibid.).

Torrance's dialogical model for the use of science in theology includes the use of scientific method in theology.[1] He explicitly mentions the need for a theological "*dialogue* with the other sciences" with regard to "epistemological and methodological questions."[2]

The extent of this dialogue is described below in terms of the impact of the use of scientific method in theology. This impact may be surveyed in terms of at least twenty proposals for the use of science. These proposals may be categorized in terms of: (1) six dialogical uses for the methods of historical, natural, and human science, (2) five explicit references to dialogical use of scientific method, and (3) nine implicit references to dialogical use of scientific method.

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[1]"Natural science and theological science are not opponents but partners before God, in a service of God in which each may learn from the other how better to pursue its own distinctive function, how to better be natural science or how to better be theological science. This is a relationship that is not one sided but mutual" (*Ground and Grammar,* 7).

[2]*Theological Science,* xii, emphasis mine. For Torrance, epistemology, or the way of knowing cannot be separated from the what of knowledge (ibid., 10, 91). However, he writes of a use of science in theology "especially in regard to questions of method" (ibid., 107). See also *Space, Time and Resurrection,* 23-24.

Use of Historical, Natural, And Human Science

In earlier sections Torrance's Christiological use of historical, natural, and human sciences was introduced. The specific uses of these sciences in dialogue with theology will now be surveyed as follows: (1) Torrance proposes the use of historical science in his historical-theological method to assess the historicity of Scripture references to God's acts in space and time.[1] He also proposes other uses of science based on an "indirect comparison" between the methods of natural, human, and theological science. Thus science (2) clarifies relations between the knower and the object of theology;[2] (3) protects

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[1]"Wherever theology has to do with acts of God in space and time it is no less interested than historical science in the truthfulness of historical facts. . . . Theological and historical science overlap at this point" (*Theological Science,* 312; cf. 284-285). This includes supernatural aspects of the story. For example, a "full positive account of the historical Jesus . . . must include an assessment of His *resurrection* as a real historical event occurring in the same sphere of reality to which we human beings belong" (ibid., 335). However, "if God has become Man in the historical Jesus Christ . . . that is an event in space and time that cannot be fully appreciated by ordinary historical science" (ibid., 324). Theology may not dispense with its historical roots in the historical Jesus, even though the historical foundation of our knowledge in Him must be laid open to historico-critical investigation (ibid., 295). See *Reality and Evangelical Theology,* 39; *Space, Time and Resurrection,* 6ff.; *Divine and Contingent Order,* 63-64.

[2]*Theological Science,* 284-285. "Thus in distilling among the sciences a healthy scepticism in regard to their powers of penetration and explanation, a theological science

theology from degeneration into ideology, (4) protects theology from the corrosion of its purity by nonscientific elements; (5) contributes to the scientific status (or objectivity) of theology;[1] and (6) facilitates theological communication by clarifying its interpretive framework, conceptual content and forms, and cognitive instruments.[2]

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that acknowledges its own relativity before God cannot but contribute to the purity of the human sciences, but it can hardly do that unless it is prepared to enter into a genuine dialogue with them in which the limited objective and range of each science will be brought to view. This in turn should have a healthy effect upon theological science, for it will help to remind it that scientifically its dogmatic formulations are to be regarded as operationally defined through their service to the one supreme Truth that cannot be exhausted by our conceiving or speaking of him" (ibid., 284).

[1]"Indirect comparison of theological science with the other sciences [is] . . . in the interest of theological purity and in the struggle to prevent theology from degenerating into an ideology. . . . Christian theology . . . [has] a genuine interest in the preservation of its purity against the corrosion that threatens from the side of non-scientific factors" (ibid., 285). The method of pure science may clarify the method of theology helping it learn, and reminding it about, objectivity (ibid., 16, 85, 284; *Theology in Reconstruction,* 17).

[2]*Theological Science,* 285. There is need for "critical revision" of "theoretical framework" in theology in "the searching light of scientific inquiry" (*God and Rationality,* 5) to create appropriate cognitive instruments for apprehending the harmonies and symmetries of the divine grace in which is enshrined the inner logic of God's operations in the universe (*Transformation and Convergence,* 282; also *Reality and Scientific Theology,* 79-82, 91).

Explicit Dialogical Use

The previous section surveyed Torrance's use of historical, natural, and human sciences as dialogue partners with theology. This section surveys his proposal of five explicitly dialogical uses of scientific method in general in theology. "Dialogue" with scientific method may be used to clarify: (1) where "natural theology finds its proper place,"[1] (2) theological method in light of its subject matter which is the Word of God, (3) the distinction of objective theological realities from the subjective states of theologians,[2] (4) common ground between science and theology, and (5) how "elucidation of a set of problems in one field of inquiry may well assist the solution of a parallel set of problems in the other field of inquiry."[3]

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[1]Theology "cannot properly take place without *constant dialogue* with the natural sciences . . . [and with their] searching questions" (emphasis mine) (*Space, Time and Resurrection,* 23-24). "It is in this kind of *dialogue* that a *modern natural theology finds its place,* in the overlap between a philosophy of theological science and a philosophy of natural science" (emphasis mine) (ibid., 23, n. 36).

[2]*Theology in Reconstruction,* 17. Science helps theologians learn "faithful-[ness] to the nature of the reality into which they inquire and so to be real in their thinking" (*Theological Science,* xiii).

[3]*Transformation and Convergence,* xii. Theology and science have a great deal in common in spite of their very different objectives. They may have to learn or indeed unlearn in *dialogue* with each other how to overcome some persistent difficulties (ibid., xii). See also *Theological Science,* xvii, 104-105.

Implicit Dialogical Use

Dialogue is implicit in other uses of science mentioned by Torrance. In connection with a reference to ecumenical dialogue,[1] he recommends use of insights, problems, and analogies[2] arising from scientific method (1) to clarify the analogical mode of theology, (2) to evaluate analogical complexes of theological statements,[3] (3) to facilitate "precise articulation"[4] in theology, (4) to protect against

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[1]"Scientific work of this kind has considerable ecumenical significance. . . . Ecumenical dialogue that brings these non-theological factors to the surface can in its turn serve rigorous scientific work in theology" (*Space, Time and Incarnation,* viii-ix).

[2]On the one hand, he seems to dismiss analogies from science as really of quite a different order of things than analogies in theology (*Theological Science,* 173). On the other hand, there is analogical comparison and contrast between the languages of science and theology (ibid., 25). The relation cannot be construed in terms of analogy because it is translogical and cannot be logicalized or resolved into language alone. However, it might be right to think in terms of an analogy, provided that we understand by that something more than what is conceptual and linguistic (ibid., 293-294).

[3]Note that analogical existence statements correspond to God. However, the analogy is not with God, but between statements. A complex of existence statements cannot be reduced to a single statement and are only paradigmatic. They are verified by repetition of the original intuitive experiences that gave rise to them. Intuitive judgment must also be fertile in illuminating problems (ibid., 127, 238-242). See also ibid. 52, 143, 174, 182.

[4]*Space, Time and Incarnation,* viii. See Stephen Arthur Simmons, "The Semantics of God and Nature in the Writings of Thomas F. Torrance" (Ph.D. diss., The University of Chicago, 1995). Theology involves biblical as well as extrabiblical

confusion of "knowing [method] and what is known [content]" in theology, (5) to clarify the "legitimate subject-matter" of theology, and (6) to assist theology to "penetrate into the inherent intelligibility of its own object."[1] Moreover, (7) ecumenical dialogue is implied in the use of scientific epistemology to clarify "coordinates for the reunification of science and theology."[2]

Dialogue is also implied in the proposal that (8) the scientific method "has much to teach theological science about realism;"[3] and may be used in (9) "testing and

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language. It "must step in to help men refer their thoughts properly beyond themselves to God. . . . We use language with a semantic intention . . . to refer other minds to something [God] beyond ourselves" (*Theological Science,* x).

[1]*Space, Time and Incarnation,* viii. Scientific "frameworks of thought" may penetrate into the intelligibility of God (*God and Rationality,* 99). In spite of the special nature of its subject-matter, Natural Theology should find congenial the altering framework of thought in the scientific world of today (ibid., 102).

[2]*The Christian Frame of Mind,* 88. This will come "through thinking out the epistemological interrelations of theological science and natural science, where the cultural rift is deepest" (ibid., 88). Theology needs "a profounder equilibration in its understanding of . . . theological science and natural science. And to that I believe rigorous natural science, operating with its profound integration of physical and intelligible ingredients in nature and our knowledge of it, has a great deal to contribute" (*Christian Theology and Scientific Culture,* 143-144).

[3]*Reality and Evangelical Theology,* 12. See *Christian Theology and Scientific Culture,* 23; *The Christian Frame of Mind,* 107-124; 65-86; *God and Rationality,* 29, 41-42, 55, 83, 93-94. Torrance's realist epistemology is justified by

questioning" the empirical correlates of theology.[1]

These sections have surveyed Torrance's dialogical model for the limits and extent of the use of science in theology. This is based, for him, on the fact that there are similarities and differences between scientific and theological method. Torrance makes at least nineteen specific proposals for the use of scientific method in theology. These have to do with dialogue with historical, natural, and human science, and with explicit and implicit references to dialogical use of scientific method in general. The next section surveys Torrance's dialogical model for the use of scientific theory in theology.

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common sense and the metaphysical assertion that science is not concerned with objects that are relative only to subject*s*, but with objects that are also relative to other objects and therefore able to control our subjectivity (ibid., 29, 41-42, 55, 83, 93-94; Klinefelter, 132-134). See P. Mark Achtemeier, "The Truth of Tradition: Critical Realism in the Thought of Alasdair McIntyre and T. F. Torrance," *Scottish Journal of Theology* 47 (1994): 355-374.

[1]*Space, Time and Resurrection,* 23. "Theological formulations which are concerned with the creative and redeeming acts of God in space and time cannot be without their *empirical correlates,* in respect of which they are *open to critical questioning and testing* from the natural (including the human) sciences" (ibid., 23; emphasis mine). Empirical correlation is evident in his discussion of evolution (*Ground and Grammar,* 111; *The Christian Frame of Mind,* 22; *Divine and Contingent Order,* 1, 18ff., 73; see also *Christian Theology and Scientific Culture,* 115; *Space, Time and Incarnation,* 89-90; *Space, Time and Resurrection,* 23; *Transformation and Convergence,* 281-282).

Dialogical Use of Scientific Theory

As with the use of scientific method discussed in the previous sections, Torrance's dialogical model for the use of science in theology arises from similarities and differences between scientific and theological theory.[1] On the one hand, there is a limit to the use of scientific theory in theology. Scientific theory cannot contribute to the material content or subject-matter of theology.[2] On the other hand, Torrance's dialogical model includes some uses of scientific theory in theology. He writes: "scientific understanding [theory] . . . must be taken into account" in theology.[3] This use of science as a dialogue partner with theology may be described in terms of fifteen explicit and

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[1]For Harink, Torrance's philosophy of science "has yielded a theory of theory-making which is both satisfying and scientifically sound. He has shown us that theories are not abstractions or deductions from experience, but inventions of our mind, through which we understand reality in its inherent rationality" (Harink, 133).

[2]*Space, Time and Incarnation,* viii; *Christian Theology and Scientific Culture,* 27.

[3]*Reality and Evangelical Theology,* 11. There are "several positive aspects in recent scientific change which may affect Christian theology beneficially" (*Christian Theology and Scientific Culture,* 27). This is because "patterns disclosed by scientific research in the space-time universe . . . constitut[e] . . . a 'created correspondence' (Karl Barth's expression) to the uncreated rationality of God himself" (*The Christian Frame of Mind,* 28). Therefore scientific cosmology must be "thought carefully" into eschatology (ibid., 63).

implicit dialogical uses for scientific theory in theology.

Explicit Dialogical Use

The following are six of Torrance's explicit references to the use of scientific theory in theology in terms of "dialogue." He proposes that (1) "dialogue" with scientific theory may make a "critical and constructive contribution" to theology "at the basic level of . . . controlling beliefs and concepts."[1] In addition, (2) "dialogue can help theology to purify its apparatus of concept and term[inology] from time-conditioned and pseudo-theological as well as pseudo-scientific" concepts.[2] "Dialogue" assists theology (3) to be scientific in its "fundamental attitude

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[1]"The fact that science and theology do have common ground within our western tradition helps to explain why real dialogue is possible . . . at the basic level of their controlling beliefs and concepts, without compromise on either side. . . . The further dialogue . . . is pursued, the clearer it becomes that . . . [they] have both critical and constructive contribution to make to each other, not least where they are so different" (ibid., ix).

[2]*Divine and Contingent Order,* 83-84. "Certainly one of the benefits which theology today derives from dialogue with the natural sciences, within the radically transformed outlook upon the universe which they have brought about, is the discovery that the non-theological problems which have troubled so many theologians in the last two centuries are now being discounted by scientists themselves as pseudo-problems for the grounds that gave rise to them, e.g. a closed mechanistic universe, have largely disappeared" (*Space, Time and Resurrection,* 183). On world-views (including the Newtonian and Einsteinian world views) see *Divine and Contingent Order,* 62-64, 75-82.

to the universe,"[1] (4) to be "properly free and open toward God,"[2] and (5) "to unfold knowledge" of its object (God).[3] Finally, (6) "constant dialogue with the natural sciences" is needed "if we are to remain faithful to God."[4]

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[1]Ibid., 1-2. Theology "cannot pursue its activity in a sealed-off enclave of its own, but it must take up the relevant problems and questions posed by the other sciences" (*Space, Time and Incarnation,* viii).

[2]"Clearly theology needs *dialogue* with natural science *to keep it properly free and open toward God,* and natural science needs dialogue with theology to keep it properly free and open toward the contingent universe" (emphasis mine) (*Divine and Contingent Order,* 73; also 83). *Divine and Contingent Order* also deals with morality and science; disorder and contingence; contingency, science, laws in nature, Darwinism (ibid., 26-61, 81-85, 90-142).

[3]Ibid., 8-84. This takes place "on the proper ground of his self-revelation to mankind within the structures objectivities and intelligibilities of the space-time world" (ibid., 83-84).

[4]*Space, Time and Resurrection,* 23. For Torrance, the space-time structures and intelligible order shared by science and theology make it necessary for authentic theology to use science as a dialogue partner in order to foster the faithfulness of theology to God (*Christian Theology and Scientific Culture,* 27). All "thinking, even about God, can take place only within space and time and the rational structures to which they give rise" (*God and Rationality,* 99; also *Transformation and Convergence,* 249-250). In addition, "Genuine scientific discovery of the world . . . can only serve to draw us nearer to God" (*Reality and Evangelical Theology,* 11; also 25). Finally, "the increasing scientific understanding of the universe . . . must be taken into account in our continuing appropriation of the divine revelation and our deepening understanding of his self communication in Jesus Christ" (ibid., 11).

Implicit Dialogical Use

The terminology of dialogue is implicit in the following four of Torrance's proposed uses of scientific theory which are parallel to some uses of scientific method.[1] Dialogue is implicit in that relationship with God, which Torrance views as dialogical,[2] is a recurring theme in his description of the use of scientific theory. The use of scientific theory in theology (1) facilitates knowledge of the Creator in Natural Theology;[3] (2) clarifies empirical correlates for every aspect of theology in the world where God has revealed Himself;[4] (3) provides

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[1]See earlier section in this chapter on Dialogical Use of Scientific Method.

[2]"It is very easy to do this [the task of theology] in the wrong way, by breaking off our conversation with God, or conducting it, as it were, behind His back, as if He were not actually party to it. This would mean the transmutation of dialogical theology" (*Theological Science,* 128).

[3]*Space, Time and Resurrection,* 23, n. 36. Natural theology correlates knowledge of created beings with knowledge of the Creator, looks through the universe to God, and coordinates theological and physical concepts (*Reality and Scientific Theology,* 33-36, 52). Natural Theology is natural to science and to theology due to Torrance's unitary concept of rationality (ibid., 92-94).

[4]"Our understanding of the on-going universe itself cannot but enter into the coefficients of our theological statements, e.g. in their *empirical correlates,* not only when we are concerned specifically with creation and incarnation but also *with every aspect of a theological account* of God's interaction with us in the world where time and space constitute the orderly medium for divine revelation to man and human knowledge of God" (emphasis

analogical terms for theological expression of "the relationship between the creation and the Creator;"[1] and (4) facilitates articulation of a theological language concerning God that avoids empty formalism.[2]

The dialogical character of Torrance's model for the use of science is also implicit in five uses of scientific theory which are not parallel with any of the proposed uses

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mine) (*Divine and Contingent Order,* 1). On limited correlation see *Space, Time and Incarnation,* 89-90. See also *Divine and Contingent Order,* 2; *Reality and Evangelical Theology,* 27, 152-153; *Transformation and Convergence,* 248-249.

[1]*Space, Time and Incarnation,* 56. "Our ordinary terms and concepts . . . must be stretched and adapted in accordance with the relationship between the creation and the Creator. If they are to fulfill their intention in speaking about God they must be made to point beyond the spatial and temporal limits of the contingent world in a relation of transcendental reference, yet not in such a way that they are detached from the contingent world out of which that reference is made. If they were cut off like that they could not mean anything to us at all, for they would not be grounded with us in the same relation which, as human creatures within this world, we have with the Creator of all things" (ibid., 56).

[2]*The Christian Frame of Mind,* 34; *Christian Theology and Scientific Culture,* 115. A theologian avoids "empty formalism" when operating based on God's revelation in "the *spatio-temporal structures* and continuities of the created order" allowing them "to *exercise appropriate constraint over all his formulations.* . . . Through persistent attention to the empirical correlates of theological knowledge . . . the theologian may maintain his orientation to objective reality" (emphasis mine) (ibid., 115). Nature is a sounding board for theology which becomes theologically articulate when correlated with Christ (*The Christian Frame of Mind,* 34).

of scientific method. Questions raised by "interaction [dialogue] with [theoretical] scientific developments" may: (1) influence "radical and critical clarification of its [theology's] own conceptual tradition" and (2) assist it to "take deeper root and grow within" scientific culture.[1] Torrance (3) implies a limited "overlap in content" [theory] between other sciences and theology "out of which there rises a mutual criticism [dialogue] that helps to maintain their authority."[2] He proposes (4) that "recent scientific change [in theory] . . . can play a healthy role in helping theology clarify its own way of thinking and formulating

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[1]*Christian Theology and Scientific Culture,* 15. Theology must test the controlling ideas of scientific culture (ibid., 15). If we think within the paradigms of Einstein's science we are driven back to the truths of classical theology *(Ground and Grammar,* 145; see 110-145; *Transformation and Convergence,* 243-261). Weightman argues that Torrance is not arguing from science to God since classical theology stands behind the cosmology of Einstein (Weightman, 194; see Torrance, "Ultimate Beliefs and the Scientific Revolution," in *Transformation and Convergence,* 191-214). This way of thinking is not so new in theology as in natural science (ibid., 276-277; see *Reality and Scientific Theology,* 20).

[2]*Theological Science,* 282, n. 1. For Torrance, "While theology has some measure of overlap with them [natural sciences], and even more with the human sciences, its uniqueness means that it does not overlap very much with their kind of authority, and betrays itself when it seeks to acquire it" (ibid.). Torrance also refers to "strong reciprocal relations and dependencies" between science and theology (*Christian Theology and Scientific Culture,* 7).

truth."[1] Finally, (5) "Scientific understanding of the universe today" (scientific theory) may be used "to open out the context" "for fresh theological construction."[2]

In summary, this section has surveyed Torrance's dialogical model for the limited use of science in theology in terms of similarities and differences between scientific and theological theory. Torrance makes fifteen explicit and implicit proposals for the use of scientific theory. It is evident that there are various tensions in his dialogical model: (1) the limits/exclusion of science and the extensive uses of science in theology; (2) indirect in contrast with

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[1]Ibid., 27. Both theory and method seem to be included in his references to a more flexible and faithful way [method] of knowing and formulating [theory] (ibid., 27-39).

[2]*Divine and Contingent Order,* 11. Torrance does not try to fit theology into a scientific world-view. Rather, he tries to think out the implications of theology and to bring these into discussion with the implications of our understanding of the cosmos (*Space, Time and Resurrection,* xi). For example, if the resurrection was an objective act of God within space, time, and history, then we must try to interpret it as such. Rigorous scientific fidelity means not to force upon it an alien framework of conceptual connections (ibid., 44; see also *Theological Science,* 319-320). On the one hand, "just as in justification the law is not destroyed but established, so in the resurrection time is not annihilated but recreated, for it is *taken up in Christ,* sanctified in his human life and *transformed in his resurrection*" (emphasis mine) (*Space, Time and Resurrection,* 98). On the other hand, "several aspects of the new scientific outlook upon the universe . . . [have] a bearing upon the way in which a scientific theology may *make its own proper understanding of the resurrection intelligible within the rational structures which it shares with the other sciences*" (emphasis mine) (ibid., 184).

direct use of science; and (3) use of historical-critical and/or historical-theological science. Finally, given the extent of the uses of science presented by Thomas Torrance, one might consider whether there is any significant aspect of theology where science is not used. These issues are addressed in chapter 4. The next section of this chapter summarizes the evidence presented concerning the postmodern, Christological, and dialogical nature of Torrance's model for the use of science in theology.

Summary

This chapter has covered a lot of ground. The first section introduced Thomas F. Torrance and his model for the use of science in theology. Torrance is a prolific and outstanding theologian who has proposed a model for the use of science in theology. The importance of his model is indicated by Torrance's many professional accomplishments and by the favorable assessments given by his peers.

The second section of this chapter addressed the issue of Torrance's responsiveness to the postmodern shift in science and in its use in theology. While he does not identify himself as postmodern, Torrance's contemporary relevance is evident in his discussion of historical shifts in science and its use in theology, and of persons and issues related to these shifts. Responsiveness to the

postmodern shift is also evident in Torrance's perspective on science as influencing the overcoming of dualism in theology. In addition, he goes beyond traditional modern options for the use of science in theology.

In the third section of this chapter, the Christological nature of Torrance's model for the use of science in theology was presented in terms of his view of science and his view of theology. First, Torrance has a high view of the formal principles of science and their application to individual sciences. Science is objective, rigorous, disciplined, methodological, and organized knowledge. It searches for the elemental form of its object and reduces knowledge to its basic order. It attains new knowledge by allowing what we already hold to be knowledge to be questioned as we use ordered questions to penetrate intuitively into the order of the object studied.

Second, Torrance defines theology as the science of the knowledge of God[1] in Christ, in Scripture, in the world. However, Torrance's model for the use of science in theology is Christological.

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[1]Concerning his faith in God, he writes: "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" (*Theological Science,* ix).

1. The use of five formal principles of scientific method is evident in Torrance's fivefold definition of theological science in terms of Christology.

2. The limited use of special sciences is based on indirect comparison and contrast with Christological theological science.

3. The revelation of God in Christ is both a material and formal source and norm for theology and thus determines the nature of the model for the use of science in theology.

4. Formal principles of Christological science guide the scientific contrapuntal method in which not only interpretations of Scripture but also Scripture itself are revised in the light of the revelation of Christ.

5. The use of historical science in biblical interpretation is controlled by presuppositions about relations between the interpreter and Christ.

6. The higher Christological levels of theology control the use of empirical correlates derived from other sciences in Natural Theology.

A fourth section of this chapter presented the dialogical nature of Torrance's model for the use of science in theology. The dialogical model responds to the similarities and differences between science and theology. It proposes a complementarity between science and theology

with a limited use of science in theology which tends to be more indirect than direct. The model also recommends dialogue between theology and science rather than independent philosophical dialectic between them.

This dialogical model is also presented in terms of specific uses of scientific theory and method in theology. The language of dialogue is explicit or implicit in relation to many uses for scientific method and theory in theology. Dialogical use of scientific method and theory may facilitate, teach, or assist theological assessment, clarification, protection, testing, questioning, thinking, insight, historicity, purity, unity, openness, problem solving, verification, interpretation, objectivity, realism, subjectivity, frameworks, concepts, empirical correlates, articulation, formulation, communication, cognitive instruments, articulation, terminology, analogy, authority, and construction.

Conclusion

In general terms Torrance has provided a very coherent model for the use of science in theology. Responsiveness to the postmodern shift has facilitated his deconstruction of traditional views of Christology, Bibliology, and Natural Theology. The Christological nature of his theology in turn supports a comprehensive and coherent model for the use of

science in theology. This is evident in the wide range of dialogical uses for science which he proposes.

However, there seem to be elements of incoherence in Torrance's model. First, the following questions arise from a consideration of Torrance's model. Is God the object of theology? Or is it God in Christ, or in Scripture, or in the world? Which of these is the locus for use of the formal principles of science? What prevents one from defining scientific theology in relation to all these stages of the revelation of God? If Christ is a formal and material norm, why are Scripture and nature not also formal as well as material norms?

Second, on the one hand, Torrance suggests that Christology and Bibliology are to be revised in the light of each other. On the other hand, he seems to give methodological priority to Christ. This seems to be based on the presupposition of a discrepancy between the truth of God and of Scripture which is bridged and yet not bridged in Christ. Scripture falls short of revelation in Christ and its "irrelevant overtone" is revisable in the light of Christ. Does this not add up to a revision of Scripture revelation in light of an interpretation of Christ? This seems to make the interpretation of Christ to be a more authentic revelation than Scripture. Torrance views this

approach as developed from Scripture. However, he seems to recognize the potential incoherence here when he refers to this approach as non-logical.

Third, it is not clear how historical science impacts on the relations between interpreter and text and Christ. This unusual and ambiguous impact of historical science on these relations probably explains Torrance's reference to the historical study of Scripture as historical-theological. Torrance has not demonstrated how he can avoid subordinating God to human interpretation unless God has revealed some standard for such interpretations. In order to evaluate an interpretation of Christ, does one make use of authoritative interpretations such as those developed within the ongoing history of the Christian Church, or does one use Scripture?

Fourth, while Torrance rejects Natural Theology as a foundation or criterion for positive theology, he welcomes Natural Theology as the basis for philosophical dialogue with other sciences. Thus Natural Theology guides intimate correlation of physical and theological statements and concepts, and is a necessary/inescapable connection between natural and theological science on all levels. Torrance does not make it clear how Scripture remains normative in this process of theological coordination with empirical correlates.

Fifth, there are various tensions in Torrance's dialogical model: (a) the limits/exclusion of science and the extensive uses of science in theology; (b) indirect use in contrast with direct use of science; and (c) use of historical-critical and/or historical-theological science. Given the extent of the uses of science presented by Thomas Torrance, one might consider whether there is any significant aspect of theology where science is not used.

The next chapter describes and evaluates Langdon B. Gilkey's model for the use of science in theology.

CHAPTER III

THE USE OF SCIENCE IN LANGDON B. GILKEY'S EMPIRICAL THEOLOGY

The problem of, and historical background to, the use of science in theology in the writings of Thomas F. Torrance and Langdon B. Gilkey have been introduced in chapter 1. Chapter 2 presented Torrance's postmodern, Christological, and dialogical model for the use of science in theology. In chapter 3 an analytical description and partial evaluation[1] of Gilkey's model is presented.

Introduction

Gilkey's model may be introduced by addressing the following questions. Who is Langdon Gilkey? Does he propose a model for the use of science in theology?

Who Is Langdon Gilkey?

Langdon Gilkey was born to liberal Protestant parents in Chicago in 1919. He was educated at Harvard University and Columbia University where he attained his A.B. and Ph.D.

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[1]Further evaluation by comparison and contrast with the model proposed by Thomas Torrance is provided in chapter 4.

degrees in 1949 and 1954. He taught at Yenching University, near Peking, China, from 1940-1941. During the World War he was interned by the Japanese from 1941-1945, first at Yenching University, and later in Shantung Province. He was an instructor in philosophy of religion at Union Theological Seminary from 1949-1950; lecturer in religion at Vassar College from 1951-1954; professor of theology at Vanderbilt University Divinity School from 1954-1963, and at University of Chicago Divinity School from 1963-1976, where he was the Shailer Matthews Professor of Theology. He was also the Fulbright professor at Koyoto University, Japan, in 1975.[1]

Gilkey is an outstanding and prolific[2] theologian whose contribution to theology may be indicated by a survey of his accomplishments, awards and assessments by his peers. He received the Fulbright Scholarship to Cambridge University from 1950-1951; and the Guggenheim fellowship to Germany from 1960-1961, and to Rome in 1965. He was president of

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[1]Ann Evory, ed., *Contemporary Authors* (Detroit, MI: Book Tower, 1982), 7:183-184; Clifford, "*The Relation of Science and Religion/Theology in the Thought of Langdon Gilkey,*" 2. See publisher's note in Langdon B. Gilkey, *Maker of Heaven and Earth: The Christian Doctrine of* Creation (Garden City, NY: Doubleday, 1959; reprint edition Lanham, MD: University of America Press, 1985), ii; hereafter cited as *Maker of Heaven and Earth.*

[2]See Gilkey's bibliography in this dissertation and in David W. Musser and Joseph L. Price, eds., *The Whirlwind in Culture: Frontiers in Theology* (Bloomington, IN: Meyer Stone, 1988), 263-270.

the American Academy of Religion from 1978-1979, and is a fellow of the Society for the Promotion of Science.[1]

The following are some representative assessments by Gilkey's peers. Hans Küng comments: Gilkey is "one of the most prominent theologians" who "perhaps more than any other . . . [strengthens] the conviction that we . . . [are] in a new paradigm shift."[2] For David Mason, much may be gained from Gilkey's "wonderfully rich" thought which is "keenly attuned to the voices of modernity and postmodernity"[3] and Christian tradition; and a guide to the next generation of theologians and the theological agenda of the twenty-first century.[4] John Godsey observes: "There is no theological writing in America more profitable."[5] David Tracy writes:

> With the exception of Paul Tillich, it is difficult to name another twentieth-century

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[1]Evory, 7:184.

[2]Küng, "Paradigm Change in Theology," in *The Whirlwind in Culture*, 67.

[3]David R. Mason, "Gilkey on 'God and the World': An Appraisal," *American Journal of Thought and Philosophy* 16, no. 3 (September 1995): 326.

[4]Ibid. Since his first book, *Maker of Heaven and Earth* (*MHE*) (1959), much of Gilkey's prodigious theological output has been directed to illuminating the relations between God and the temporal process. The decades between *MHE* and *ME* (1979) were especially fruitful in producing an integrated and highly nuanced theological vision (Mason, 315).

[5]John D. Godsey, "Review of *Naming the Whirlwind*," *The Christian Century* 87 (10 June 1970): 729.

> theologian who so straight-forwardly addresses the major issues that the incredible history of our century forces upon our attention.[1]

Does Gilkey Propose a Model for the Use of Science in Theology?

Gilkey's peers have commented on his theology in a way that indirectly indicates that he has proposed a model for the use of science in theology. He is regarded by his peers as a distinguished commentator on the confrontation of Christianity and secularization, as a spokesman for the empirical movement in Christian theology, and as a student of the relations of science and theology.[2]

Anne Marie Clifford writes that Gilkey is "a major twentieth-century theologian who has pointedly responded to

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[1]Tracy, "The Question of Criteria for Inter-Religious Dialogue" in *The Whirlwind in Culture,* 246. Gilkey is described as "perhaps the most distinguished successor to Reinhold Niebuhr and Paul Tillich" (Philip Hefner, "Theology and Science Approach the Third Millennium: A Review Essay," *Perspectives in Religious Studies* 22 [Spring 1995]: 66-69). Gilkey admits dependence on the theology of Tillich and calls himself a "Tillichean" (*Gilkey on Tillich* [New York: Crossroad, 1990], xi). He was fascinated by the "God is dead" theology while convinced of the reality, power, and grace of God and the relevance and validity of the classical symbols of theology (Langdon B. Gilkey, "Introduction: A Retrospective Glance at My Work," in *WIC,* 23-24; idem, "New Modes of Empirical Theology," 346-350). In order to avoid repetition, after the first citation of works by Langdon B. Gilkey subsequent citations will mention only the titles.

[2]"About the Author," in Langdon B. Gilkey, *Religion and the Scientific Future,* vi. See Clifford, 1-7.

the challenges posed to theology by science."[1] According to Donald W. Musser, "no one has documented the far-reaching effects of science and technology on contemporary religion more than has Langdon Gilkey."[2]

According to Joseph L. Price, a "signal" contribution to Christian theology is made possible because of Gilkey's

> ability to traverse traditional disciplinary boundaries, appreciating the methods and conclusions of scientific . . . studies and appropriating them into his own theological method and reflection.[3]

Philip Hefner suggests that Gilkey is "one of the most creative and prolific theologians" and one of the few who "engages in theological construction" "in the light of science." He also "gives intense analysis of how scientific thinking plays into the religious situation today and how it challenges theology." He is also viewed as "a profound commentator on the natural sciences." Further, Hefner comments that Gilkey "*models* what he considers to be the

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[1]Clifford, 1-2. Clifford traces Gilkey's interaction with empirical theologies (chapter 2), the nature, methods and presuppositions of science (chapter 3), the cognitive status of theology in a scientific culture (chapter 4), and the religious dimension of science (chapter 5). She also evaluates him for consistency and development (chapter 6).

[2]Musser, "Theological Reasoning: A Tillichian Perspective," 106.

[3]Joseph L. Price, 151.

appropriate way of relating theology and the sciences."[1]

That Gilkey proposes a model for the use of science in theology is directly indicated in his own words. He writes:

> The most important change in the understanding of religious truth in the last centuries--a change that still dominates our thought today--has been caused more by the work of science than by any other factor, religious or cultural.[2]

Gilkey comments that recent philosophy of science is "appropriate . . . even more to religious understanding" than to the sciences themselves.[3] He concludes that this seems to resolve, "in principle, . . . the philosophical problems of the interrelation of scientific theory and theology, and so of scientific knowledge and religious disclosures."[4] Gilkey's theology has evolved through many stages.[5] However, his model for the use of science in theology is amazingly evident throughout his writings.

Gilkey and his model for the use of science in theology

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[1]Hefner, 66-69.

[2]*Religion and the Scientific Future,* 4.

[3]*Nature, Reality, and the Sacred,* 44. This "mode of philosophical understanding" has its "home ground" in the humanities (ibid.).

[4]Ibid. See Gilkey's chapter on "The Influence of Science on Recent Theology," in *Religion and the Scientific Future.* He regards his "theme" as unpopular and largely unacknowledged, namely: "the mutual influence and . . . dependence of science and theology" (ibid., 3; Raymo, 31).

[5]See chapter 1, p. 9, n. 1 above.

have now been introduced by a brief survey of his biography, awards, assessments by his peers, and his own words. The next section describes how Gilkey situates his model in terms of the history of science and its use in theology.

Responsiveness to the Postmodern Shift

Is Gilkey's model for the use of science in theology responsive to the postmodern shift in science and in its use in theology? As indicated in chapter 1, responsiveness to the postmodern shift would show that Gilkey's model is very relevant to the contemporary situation in theology.[1]

Gilkey does not describe his model for the use of science in theology as postmodern. However, he presents his model against the historical background of the recent shift

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[1]Clarke Williamson ("The Divine Obituary Was Premature," *Encounter* 31 [1970]: 396-399) and Tom Driver (Review of *Naming the Whirlwind: The Renewal of God-Language, by Langdon Gilkey, Union Seminary Quarterly Review* 25, no. 3 [1970]: 361-367) question Gilkey's responsiveness. For Williamson, *Naming the Whirlwind* is outdated since consciousness is not as anti-metaphysical or irreligious as in the 60s. However, John Shea comments that Gilkey's assessment of today's mood is supported by a study of contemporary science, theology, philosophy, and literature. For Driver, also, the modern culture Gilkey describes passed away in the 60s. He faults Gilkey's somberness and emphasis on transcendence as overlooking the postmodern optimism and emphasis on immanence. However, according to Shea, Driver dismisses too quickly Gilkey's description of funding joy and his connection of immanence and transcendence (John Shea, "Religious Language in a Secular Culture: A Study in the Theology of Langdon Gilkey" [Ph.D. diss., University of St. Mary of the Lake, 1976], 180-183).

in science and in its use in theology. This shift was designated in Chapter I of this dissertation as postmodern.[1] Gilkey's responsiveness to the recent shift is presented below in terms of his description of the history of science and the history of its use in theology.

The History of Science

Gilkey's discussion of the postmodern shift in science may be organized in terms of his discussion of (1) four periods and three shifts in the history of science, (2) an obsolete modern science, and (3) a new science.

Historical Periods

Gilkey's responsiveness to postmodern science is implicit in his description of three historical shifts that take place between four perspectives on knowledge. These four views are ancient, medieval, modern, and contemporary.

First, ancient cultures have created various value-inclusive systems. These include the Dharma in India, the

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[1]The terms *modern* and *postmodern* overlap in the following quote. "In most modern thought the cosmos is *merely* nature as understood by science. . . . Man is here 'come of age'. . . . His confidence about life and the models by which he structures his freedom tend, therefore, to be reflective . . . only of the capacities and achievements of his own autonomy. Most postmodern myths are thus myths about man and his powers" *(Religion and the Scientific Future,* 75-76). Gilkey rejects these postmodern myths (ibid., chap. 3, p. 166, n. 17).

Tao in China, and the Logos in Greece. Specially relevant to Christian theology is the fact that the Greeks replaced their mythology with the concept that the divine is a universal, timeless, and rational order.[1]

Second, medieval Christian thought posited a Hebrew-Christian framework where reason is transcended by the divine. From this perspective, human rationality reflects divine rationality; and the Greek conception of natural law is incorporated in the wider Judeo-Christian framework.[2]

Third, modern philosophy views nature as material, mathematical, universal, necessary, rational, coherent, and without purpose, quality, formal/final cause, or deity. Kant formalized this modern perspective as involving a

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[1]*Nature, Reality, and the Sacred,* 114-121. These systems explain order, disorder, sacrifice, and value-structure, antistructure, and meaning (ibid., 114). Myths are multivalent symbols whose referent is the transcendent sacred and whose meanings concern ultimate/existential issues (*Religion and the Scientific Future,* 66). Clifford comments that, for Gilkey, theology depends on myths which shape the experience of ultimacy by giving structure and legitimacy to social, political, and natural realities, tracing them back to divine foundations. Myths make pain and tragedy bearable by providing hope, and foster relations to the transcendent horizon of meaning (Clifford, 177-178).

[2]*Nature, Reality, and the Sacred,* 121-124. For Gilkey, this is a larger framework than the ancient ones since order is *transcended by* and *included in* the divine (ibid., 122).

separation between faith and reason.[1]

Fourth, contemporary thinkers (Whitehead, Tillich, Santayana) provide a way out of Kant's subjective maze, namely critical realism. This development requires a hermeneutic of science, philosophy, and theology--each with its own unique data, evidence, experience, authority, symbolism and preunderstanding.[2]

The next section will demonstrate the radical nature of the recent shift in science which is implied in Gilkey's distinction between an obsolete science and a new science. What he describes as a new science has been described in chapter 1 of this dissertation as postmodern science.

Classical Modern Science

That Gilkey acknowledges the existence of a new science is evident in his conclusion that classical modern science is outdated. His assessment of classical modern science is surveyed below in terms of (1) four of its outdated propositions, and (2) its ambiguity with regard to myth.

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[1]Ibid., 125-126; see also 43-57.

[2]Ibid., 60-73, 126-129. Kant formalized and ordered the critical view that experience is shaped by the forms of intuition (space and time), and is unified and ordered by the categories of understanding (causality and substance). However, that world of ordered sequences governed by law is only the *phenomenal* world, a construct of human sense and by the human mind out of the given (ibid., 61).

Four outdated propositions

Gilkey points out that four propositions, which are itemized below, are characteristic of a nineteenth-century "objectivist" understanding of science which is now frequently repudiated as contrary to the new understanding of science. For Gilkey, these propositions represent the kind of naïve realism involved in "the fallacy of misplaced concreteness." It is this naïve fallacy that critical philosophers from David Hume through Kant to Whitehead and Michael Polanyi along with such theologians as Bernard Lonergan and Paul Tilich have sought to challenge.[1]

Gilkey outlines these propositions as: scientific triumphalism,[2] denial of presuppositions,[3] claims of

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[1]Ibid., 45. On Gilkey and the modern crisis see Brian Walsh, *Langdon Gilkey: Theologian for a Culture in Decline* (Lanham, MD: University Press of America, 1991), 274.

[2]This is the presupposition that "science is about to answer satisfactorily its own most important questions, resolve its deepest puzzles, and thus in effect bring about, through this virtual apothesis, its own end" *(Nature, Reality, and the Sacred,* 45).

[3]This is the presupposition that "there are no effective presuppositions to scientific inquiry and so to adequate scientific judgments; such judgments, on the contrary, are purely empirical, based on objective evidence alone, and thus are influenced not at all by the locus, perspective, or preunderstanding of the inquirer" (ibid., 46).

exclusive criteria of meaning,[1] and naïve realism.[2] For Gilkey, these propositions represent "a misinterpretation of the character of the knowing process and thus a misunderstanding of scientific knowledge."[3] He proposes

> in effect a new philosophy of science, . . . [which] in principle . . . would develop an understanding of scientific knowing that would lead into the beginnings of a more encompassing epistemology, ontology, or metaphysics.[4]

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[1]Ibid., 47. For Gilkey, one can defend meaning without raising the question of truth (*Naming the Whirlwind,* 265. Ferré evaluates Gilkey in terms of the analytic tradition's dimensions of meaning: syntactic, semantic, interpretive. However, Gilkey proposes an experimental meaning which overlaps the last two categories. Ferré reverses Gilkey's method from examining existence (to uncover where God-language is legitimate) to beginning with abstract symbols (and looking for referents). Robbins views Gilkey in terms of word-object meaning and a collapse of a distinction of meaning and truth. But Gilkey refers to an experimental reference range where God-language is grounded in its actual referent given in faith experience. Kane argues that experimental reference does not establish cognitive meaning. However, Gilkey does not aim to provide a total theory of meaning. Finally, Driver's criticism in terms of meaningful usage/intentionality overlooks Gilkey's acceptance of this view (Shea, 118-132).

[2]This is the presupposition that there is "identity between the concepts, formulas, and models of science and the ontological objects to which scientific inquiry directs itself--what is to use Lonergan's phrase, 'already out there real,' or the *Ding an sich* to Kant" *(Nature, Reality, and the Sacred,* 50).

[3]Ibid., 59.

[4]Ibid., 59. Its aim is to establish, by ontology and epistemology, a philosophical theology that encompasses the sphere of religion (ibid., 59). Theology involves dialectic correlation with culture (including science), and philosophy of science (*Gilkey on Tillich,* 67, 71-73).

Modern science and myth

For Gilkey, the last presupposition mentioned above, concerning naïve realism, is the major cause of an ambiguity in classical modern science concerning myth. Myths

> are multivalent symbols, whose referent is in some strange way the transcendent or the sacred, and whose meanings concern the ultimate or existential issues of actual life and the questions of human historical destiny.[1]

For Gilkey, if one presupposes an identity between theory and reality the usefulness of myth seems to be denied. However, while modernity makes traditional myth less credible, it also paradoxically produces its own myths.[2]

On the one hand, three elements are relevant to the gradual waning of the intelligibility of mythical language.[3]

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[1]*Religion and the Scientific Future,* 66.

[2]For Gilkey, it is essential that theology's relation to and possible verification/falsification in experience must be resolved ("New Modes," 346). *Religion and the Scientific Future* deals with the meaning, character, status, uses, and sources of mythical/religious discourse in a scientific culture which leads to interesting, fruitful, as well as devastating problems (ibid., 3).

[3]Ibid., 67-68. William Thompson describes Gilkey's work with religious language and linguistic analysis ("Theology's Method and Linguistic Analysis in the Thought of Langdon Gilkey," *The Thomist* 36 [1972]: 363-393). Daniel Noel ("God-Language Grounded: A Review Article," *Anglican Theological Review* 53 [January 1971]: 57-70) and N. Schreurs ("Naar de basis van ons spreken over God: de weg van Langdon Gilkey," *Tijdschrift voor Theologie,* 11, no. 3 [1971]: 274-292) question the idea of viewing the religious dimension

1. "The secular mind understands events in terms solely of the nexus of finite causes within which they take place."[1]

2. Thus "the sacred has tended to vanish from the objective environment of man."[2]

3. "Correspondingly, the modern spirit emphasizes the creativity of human autonomy, the possibility of the 'new' in historical existence, and above all the dimension of time as the arena of human meaning."[3]

On the other hand, the modern spirit has produced its own myths. Gilkey points out that while the opposition between the modern spirit and the traditional mythical consciousness seems absolute, there is a split between modern man's intellectual comprehension and his more

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without religious symbolism. For Shea, Gilkey's concern is not linguistic but phenomenological. Ordinary language does not force the question of truth upon the question of meaning. Language is not primarily instrumental or a way of being. Also, for Gilkey, faith is a special received answer to the question of ultimacy which is ambiguously experienced (Gilkey, "Ervaring en interpretatie van de religieuze dimensie: een reaktie," *Tijdschrift voor Theologie* 11, no. 3 [1971]: 293-302; Shea, 161-173). See Charles E. Winquist, "Theology, Symbolism, and Language in the Thought of Langdon Gilkey," in *The Theology of Langdon B. Gilkey: Systematic and Critical Studies* (Macon, GA: Mercer University Press, 1999), 259-276.

[1]*Religion and the Scientific Future,* 68.

[2]Ibid.

[3]Ibid., 69.

existential self-understanding. Modern man thinks and talks in terms different from those by which he lives.[1] This is evident in that "there are modern secular myths as well as archaic and traditional myths."[2] Two examples of modern secular myths are Evolution and Marxism.[3] Interestingly, these cosmic myths seem to be in the process of being replaced by other more anthropocentric myths, such as the myth of the new scientific humanity.[4]

Gilkey's description of classical modern philosophy of

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[1]Ibid., 70-71. See chapter on "The Uses of Myth in a Scientific Culture," ibid., 65-100. A change in theology in response to modern science took place as early as the eighteenth century. "Neither the Reformers, nor most of the Enlightenment theologians, ever doubted that revelation was composed of objective propositions concerning matters of fact" (ibid., 7). "Only certain perceptive philosophers and a few theologians, especially Kant, Hegel, and Schleiermacher, saw in the Enlightenment science a deep challenge to religious language as it was then understood" (ibid., 8).

[2]Ibid., 71.

[3]Ibid., 73.

[4]Ibid., 74-85. "Since the early part of the century they [the above-mentioned myths] have both tended to be replaced by anthropocentric myths . . . [which] are in the end more characteristic of our present secular culture. . . . The questioning, empirical, secular spirit has now begun to devour its own cosmic myths, to separate them as myths from their own scientific foundations, and to test them . . . by the scientific and historical evidence at hand" (ibid., 74-75). "Not only is this myth [the scientific man] radically paradoxical, if not contradictory--a problem not unknown in previous theology. It is, as is the case with most false myths, also morally extremely dangerous" (ibid., 85).

science as obsolete suggests that he is responsive to postmodern thought. Such responsiveness is also suggested in his attitude to recent philosophy of science.

The new science

Gilkey's discussion, in the previous section, of the obsolete principles of modern science and its outdated ambiguity about myth implies responsiveness to new models of science. He makes a clear distinction between "nineteenth century science" and "twentieth century science."[1] Responsiveness to the new science is also evident in his discussion of (1) some nontraditional thought leaders, (2) the new critical philosophy, and (3) the new hermeneutics.

First, he gives a nontraditional account of science which is indebted to historians of science, philosophers of science, and philosophical theologians. These include Gillispie, Greene, Kuhn, Toulmin, Polanyi, Lonergan, Rahner, and Tillich. That these thinkers are postmodern in their attitude is implied in Gilkey's comment that "each of these men, in his own way, has challenged the traditional naturalistic account of science."[2]

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[1]Ibid., 33.

[2]Ibid., 41. Traditionally, modern science was modeled as "an impersonal activity based on a cool, tentative, logical intellect alone, drawing inductions by rules from given data, to form theories or hypotheses which can then be objectively tested by experience" (ibid.).

Second, Gilkey's view of science is expressed in terms of a shift within the modern view of science. This is evident in his discussion of the persons involved in the "transformation" of modern critical philosophy of science into a new critical philosophy. Concerning classical modern critical philosophy, he writes:

> This modern sense of what the perceiving self adds to experience began with Galileo . . . [and] was pushed further by George Berkeley and David Hume. . . . Immanuel Kant formalized and ordered this critical view.[1]

With regard to the new critical philosophy, Gilkey mentions thought leaders such as Santayana, Whitehead, Husserl, Heidegger, Tillich, Rorty, and Bernstein.[2] From the perspective of this dissertation, these thinkers may be categorized as postmodern. There is also a postmodern ring

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[1]*Nature, Reality, and the Sacred,* 61.

[2]Traditional critical philosophy continues in a new form in much of today's philosophy. Kant represents a classical formulation. However, Santayana and Whitehead improved on his distinction between the world of appearance and the real world. Husserl, Heidegger, and Tillich each represented a parallel mode of distinguishing the world of science from what Husserl called a primordial life world. In current philosophy, Rorty and Bernstein continue these motifs (ibid., 62; also 63-66). Clifford writes: "Gilkey provides warrants for the acceptability of the notion of 'self-evidence' as a basis for establishing truth in theology in the writings of Alfred North Whitehead" specifically *Modes of Thought*, 66-67 (Clifford, 183, n. 27). In conceiving of truth as an event through which disclosure of ultimate concern occurs, Gilkey (*Reaping the Whirlwind,* 147) introduces themes of interest for Heidegger (Clifford, 182-183, n. 26).

in Gilkey's comment that: "the common methodological thread that guides Whitehead, Tillich, and Santayana out of the subjectivity of the Kantian maze is the post-foundationalist (postmodern) notion of 'participation'."[1]

Third, Gilkey's postmodern awareness of the demise of logical positivism and scientific empiricism and the birth of a new philosophy of science is evident in his discussion of the new relevance of the science of hermeneutics. He points out that it is one of the main themes of the new philosophy of science that all knowing involves a preunderstanding, that all inquiry is theory-laden, and that therefore natural science is "kin" to hermeneutics.[2]

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[1]*Nature, Reality, and the Sacred,* 71. On participatory self-evaluation and self-validation by faith see *Naming the Whirlwind;* Driscoll, 59, 66; and Shea, 170. For Toulmin, this involves integration of our understanding of humanity and nature (Toulmin, "Foreword," 210, 237f., 257). This is an epistemological turn from foundationalism to holism (Murphy, *Theology in the Age of Scientific Reasoning,* 201, 205). The antifoundationalism of some postmodern thought is giving way to postfoundationalism (van Huyssteen, 580-581). Jeff Pool, "Beyond Postliberal Foundationalism: The Theological Method of Langdon Gilkey," in *The Theology of Langdon B. Gilkey* (1999), 57-158; and Jennifer L. Rike, "From Liberalism to Postmodernism: The Role of Integrity in the Thought of Langdon Gilkey," in ibid., 431-464.

[2]*Nature, Reality, and the Sacred,* 60. For Gilkey, if science cannot be adequately defended in terms of its logic of discovery, then theology need not be embarrassed by an inability to articulate totally its foundations (*Religion and the Scientific Future,* 40-47). As van Huyssteen put it, "both modernism and postmodernism . . . have been unable to come to terms with the issue of rationality in any positive way" (581).

In addition, the new hermeneutical science involves an understanding of scientific language as symbolic. It was

> with the beginning of quantum physics at the turn of the twentieth century, that physics began to become aware of the peculiar way in which its discourse is symbolic.[1]

This section has demonstrated that Gilkey's view of the history of science is responsive to the postmodern shift. This is evident in his discussion of (1) periods or shifts in the history of science, (2) an obsolete modern science, and (3) a new modern model of science. The next section describes Gilkey's responsiveness to the postmodern shift. This response is manifest in his discussion of various shifts in the use of science in theology.

The History of the Use of Science in Theology

This section continues to examine Gilkey's response to postmodernism by describing his views on the history of the mutual influence and dependence of science and theology.[2] These views are expressed in a survey of the use of science

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[1]*Religion and the Scientific Future,* 20. After discussing the impact of modern science in showing that all theological language is symbolic, he writes that "it is well to recall that it was almost another hundred years" before science came to the same conclusion about its own language (ibid., 20).

[2]Ibid., 3.

in liberal, neoorthodox, and postneorthodox theology.[1]

The Liberal Model

Gilkey's responsiveness to postmodern science is evident in that he regards as outdated the theological use of science evident in liberal theology's accommodation to changes in science. Liberal theology holds that

> God's acts . . . [do not enter] directly into the phenomenal realm of secondary causation, and so neither provided any miracles on the the one hand nor were a part of any scientific inquiry on the other.[2]

Nevertheless, for liberal theology, "God's rule over the world's order could be understood as an implication of the very story science had unfolded."[3]

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[1]Gilkey regards Liberal and Neoorthodox approaches as the most important modern options. He regards Creationism as a relatively unimportant option that ignores science and does not update its cosmology. He also rejects scientism, which he regards as religious, because of its ignorance of religion and of its own nonscientific ground (*Nature, Reality, and the Sacred*, 1-2).

[2]*Religion and the Scientific Future*, 22. Under the influence of science, "liberalism abandoned the conception of *Christian truth* as consisting of divinely given, and hence infallible, propositions . . . and conceived of it instead as a system of human, and hence relative, symbols that elucidate the depth and mystery of existence but do not compete directly with either scientific or historical knowledge" (Langdon B. Gilkey, "Theology," in *The Great Ideas Today* [Chicago: Encyclopedia Britanica, 1967], 242).

[3]"Thus religion in a scientific age could still speak of the divine activity behind and within the changes traced by science, and activity that accounted for the obvious development of things toward higher and higher forms of

Liberal theology is defined by Gilkey in terms of its acceptance of modern science and its attempt to make theology intelligible to the increasingly secular mind as the study of an immanent God. He regards this approach as courageous and momentous because it accepted dominant scientific ideas as normative and regarded Christian faith as relevant to the transformation of the secular world.[1]

Gilkey emphasizes the positive contribution of liberal theology and acknowledges that he is in a sense a liberal theologian. Yet he goes beyond liberal theology.[2] He is critical of the answer liberal theology gives to the questions which it raises: Is scientific explanation final? Does God act in history? Liberal theology proposed that

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life, of culture, of morals, and of religion" (*Religion and the Scientific Future,* 22).

[1]*Naming the Whirlwind,* 17, 75-78. For treatment of Schleiermacher and Ritschl, see *Reaping the Whirlwind,* 21-216. On the linking of the theological and scientific concepts of providence and evolution see Langdon B. Gilkey, "The Concept of Providence in Contemporary Theology," *The Journal of Religion* 73 (1963): 171-172.

[2]*Naming the Whirlwind,* 76; Gilkey, "Neo-Orthodoxy," 256; idem, *Creationism on Trial: Evolution and God at Little Rock* (San Fransisco: Harper and Row, 1985), 56; hereafter cited as *Creationism on Trial.* For Gilkey, concerns of experience, religious language, and secularity interface with neoorthodox apologetics with mutual influence and transformation. He is best understood in continuity-discontinuity with the apologetic left wing of neoorthodoxy. Like most theologians, he is working out of, and at the same time reworking, a theological tradition (Shea, 7, 21, n. 1).

God's rule was the implication of the evolutionary conclusions of science; and that God is the symbol of the creative force behind evolutionary progress.[1]

Gilkey points out that while liberal theology made a courageous response to the destructive effect of nineteenth-century science on theology, this liberal "resuscitation" of theology was "relatively brief."[2] This is because, in the twentieth century, the scientific idea of evolutionary progress upon which liberal theology built its religious language has disintegrated.[3] For Gilkey, after the disintegration of the liberal model, the next outstanding proposal was attempted by Neoorthodoxy. Gilkey's view of the Neoorthodox model is presented below.

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[1]*Religion and the Scientific Future,* 21-23; Langdon B. Gilkey, "Secularism's Impact on Contemporary Theology," in *Radical Theology: Phase Two, Essays in a Continuing Discussion,* ed. C. W. Christian and Glenn R. Wittig (Philadelphia: J. B. Lippincott, 1967), 19; *Naming the Whirlwind,* 78-80; "The Concept of Providence," 171-174.

[2]*Religion and the Scientific Future,* 23.

[3]Ibid., 23. In the twentieth century, "the sense of an ultimate order of progress in the nature of things . . . disappeared, leaving secular thought . . . a contingent, relative, transient, and directionless world, a world devoid of any trace of the divine. In relation to *such* a secular spirit, the theology of liberalism disintegrated. . . . [A] theology based on secular wisdom had no longer any way of speaking about God" ("Theology," 242-243).

The Neorthodox Model

Responsiveness to postmodern science and its use in theology is also evident in that Gilkey goes beyond the criticism of liberal theology's accommodation to science. He also regards as outdated Neoorthodox theology's overt and naïve attempt to reject accommodation to science. Neoorthodoxy regards the truth of religion as founded on the word of God. Thus, "in no sense was religious language . . . derived from scientific inquiry nor even significantly related to it."[1]

As with liberal theology, the Neothodox approach was short-lived. Gilkey points out that

> some of the most important causes of the decline of the neo-orthodox view of religious truth stem precisely from . . . its own distorted view of its relations to science.[2]

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[1]*Religion and the Scientific Future,* 24. For Neoorthodoxy, religious truth was not based on science. The Book of Nature was closed since God's acts are not observable. There is no science-theology conflict, relationship, or mutual dependence (ibid., 24-25). Neoorthodoxy was secular in that it held that God was not revealed in secular life and it accepted the naturalistic account of space-time reality. But it was orthodox in that *religious* meanings and ultimate concerns and questions were resolved by faith attending to God's Word. This dual posture, while the source of its very considerable power, proved its undoing in the end. Most neoorthodox theologies seemed to ground theology as Schleiermacher did: in personal 'religious experience' of faith in relation to the Word, in which humanity encounters God ("Theology," 247-250).

[2]*Religion and the Scientific Future,* 26.

Neoorthodoxy overlooks its own use of science in its assumptions that religious language is not factual, has no relation to science, and is symbolic and paradoxical. Use of science is also evident in its acceptance of historical relativity and denial of absolute, changeless, historical religious authority. Finally, the neoorthodox idea that faith alone authenticates religious truth avoids conflict with science by making theology autonomous. However, it also makes theology meaningless to contemporary thought.[1]

Thus far Gilkey's responsiveness to postmodern science has been surveyed in terms of his discussion of the impact of the classical nineteenth-century science on liberal theology and the impact of the new twentieth-century science on neorthodox theology.[2] He concludes,

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[1]See ibid., 4, 24-34, 147-148; *Reaping the Whirlwind,* 215-226; *Naming the Whirlwind,* 81-82, 84-88; "Neo-Orthodoxy," 256-261; "Trends in Protestant Apologetics," in *The Development of Fundamental Theology, Concilium,* vol. 46, ed. Johannes B. Metz (New York: Paulist Press, 1969), 142. The neo-orthodox did not consciously refashion the biblical Word to fit into the scientific world view. However, they accepted important aspects of it. The scientific world influenced their practice of hermeneutics. "The theology that was ostensibly constructed solely on the Bible was in actual fact built upon and around certain basic assumptions of modern science . . . though this dependence was never admitted and often denied" (*Religion and the Scientific Future,* 26). Mason mentions Gilkey's shift from certain Neoorthodox viewpoints to Whiteheadian viewpoints while remaining critical of both (Mason, 315).

[2]"As nineteenth-century science had demolished an older orthodox view of religious truth which had provided

> The science of the past two centuries has seemed, therefore to have had a twofold and somewhat discouraging message for religion and its truths: you can, it has appeared to say, neither be a part of us and be *valid*, nor be separate from us and maintain any *meaning*.[1]

Still other proposals have been made concerning the use of science in theology. Gilkey's responsiveness to postmodern science in his discussion of the limits of these theological proposals is surveyed in the next section.

'information' about specific space-time events . . . so the influence of twentieth-century science has likewise made unintelligible a neo-orthodox form of religious truth which sought not to preempt the place of science, but to isolate itself completely from the influence of science" *(Religion and the Scientific Future,* 33).

[1]Ibid., 33. For Gilkey, there are two levels of theological truth. On the one hand, theology provides an internally coherent scheme of symbols, which while founded on particular experience, can illuminate general experience (*Naming the Whirlwind,* 451; *Reaping the Whirlwind,* 128, 146-148). (He contrasts his position with that of Tracy in *Blessed Rage for Order* [San Francisco: Harper and Row, 1988] and Schubert Ogden in *The Reality of God* [New York: Harper and Row, 1963]). On the other hand, there is a level of truth which transcends facts and deals with relation to ultimate reality which can only be described symbolically (ibid., 148; *Maker of Heaven and Earth,* 131-132). For Gilkey, truth cannot be reduced to adequacy to experience and ontological reflection. It can break open a symbolic rendering of the world which was viewed as coherent and adequate. A reasonable argument is no guarantee of truth. A symbol may seem adequate to explain experience, and still seem to be unreal because it possesses no referent beyond itself (Clifford, 181-183). George E. Davis concludes that, for Gilkey, "a language's meaning depends on its actual use toward somehow rendering common human experience intelligible" ("Langdon Gilkey and Religious Language" [M.C.S. Thesis, University of Texas, 1979], iv).

Post-Neorthodox Models

Gilkey's responsiveness to postmodern science and its use in theology is evident in his commentary on and rejection of various postneoorthodox models for the use of science in theology. These postmodern models include radical, hermeneutical, and process theologies.

First, the use of science in "the new radical theology" manifested a "sharp reversal of all that characterized the neoorthodox period."[1] However, for Gilkey, radical theology surrendered too much to erosion of theology by science.[2]

Second, models for the use of science in hermeneutical theology tend to emphasize one of two requirements. "The Barthian side has emphasized the faithfulness to the Word as its hermeneutical principle, and the Bultmannian side the problem of the intelligibility of this Word to its modern hearers."[3] Gilkey criticizes "the new hermeneutic" (the

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[1]"Theology," 251.

[2]Ibid. "In the radical theologians, we have protests against God-language on four . . . grounds: the weakness of faith and the absence of God to our age's consciousness; the meaninglessness of all speech beyond that which concerns the immediate . . . ; the demonic, destructive character of the transcendent as a challenge to the joy and creativity of free and autonomous human life; and . . . the impossibility and destructive immorality of understanding historical evil in anything but radically secular terms. These protests are by no means new in secular thought, but that they should appear in theology is new and reflects the depth of the religious problem in our age" (ibid., 258).

[3]Ibid., 259. On Barth's influence see Gilkey, "An

Barthian side) as well as "linguistic analysis" (the Bultmanian side) for their models for the use of science. This is because they do not begin with secular experience of world events and therefore continue to have an unreal air, which is all to often unintelligible even in the church.[1]

Third, Gilkey rejects the contemporary process theology which bases its language on the metaphysical foundation of process philosophy as the means of linking science to theology.[2] Where the hermeneutic theologians presupposed faith in the Word as the basis of theology, this group of philosophical theologians tends to assume the possibility and viability of scientific metaphysics as the proper basis of theology. However, modern metaphysics is as unreal to the contemporary consciousness (referred to in this study as

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Appreciation of Karl Barth," in *How Karl Barth Changed My Mind*, ed. Donald K. McKim, 150-155 (Grand Rapids, MI: Eerdmans, 1986); also *Nature, Reality, and the Sacred,* 146.

[1]"Theology," 259. Both wings of continental theology use secular philosophy more freely than did their Barthian fathers. However, the continent is reluctant to explore Natural Theology or prolegomenon to theology. Philosophy is used within faith to make it intelligible. Faith and the word it receives are presupposed as starting points and limits for theology. The new hermeneutic presupposes a faith that is given as already active in the life of the church. Similarly, linguistic analysis of religious discourse has limited itself to analyzing the logic and uses of theological discourse (ibid., 261, 265).

[2]Ibid, 262, 263.

postmodern) as is traditional religious language.[1]

In summary, while he does not identify himself as postmodern, Gilkey's responsiveness to postmodern science is evident in his discussion of historical periods/shifts climaxing in a "new" science; and in his survey of related shifts in the use of science in liberal, neoorthodox, and postneoorthodox models. He perceives some positive elements as well as significant flaws in each of these models. He concludes that it is, in part, the impact of science that makes traditional methods of theological construction insufficient.[2] However, he does not reject the use of

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[1]Ibid., 262. "As the former depends upon a belief in a transcendent, personal deity who 'does things,' so the latter assumes a coherence in process itself and the ability of the mind by speculation to discern and elucidate that coherence—the rationalistic assumptions which our age does not at all share" (ibid., 263). It has been proposed that metaphysics/ontology mediates between the immediacy of experience and the object of theology ("New Modes," 347). However, the idea "that philosophical thought is a special mode of *knowing* what is more 'real,' more 'actual,' more persuasive, or more fundamental . . . is precisely what most of modern philosophy does not share" (ibid., 348).

[2]"A scientific culture appears to make difficult and irrelevant all statements about the universal, the necessary, the transcendent, and the sacred. . . . Thus have both the traditional mythical symbols of our religious communities, and the traditional metaphysical structures of our philosophical history, dissolved together. 'God' and metaphysics 'died' in the West in approximately the same half century; and it is not at all strange that this death took place during the period in which science rose to universal cultural dominance as the paradigm of knowing and thus the arbiter of the real and the true" *(Religion and the Scientific Future,* 122).

science. Gilkey's model for the use of science in theology is responsive to as well as critical of the postmodern shift. Now that Gilkey's historical survey of science and its use in theology has been reviewed, the cosmological nature of his model may be described and evaluated.

A Cosmological Model for the Use of Science in Theology

Gikey's responsiveness to the postmodern shift in science and its use in theology was surveyed in the previous section. This section address the following questions: What is the nature of Gilkey's model for the use of science in theology in terms of his view of science and his view of theology?[1] Is his model coherent? His model will be described in terms of whether it is controlled more by his Natural Theology, Bibliology, or Christology. It will also be evaluated in terms of whether these various theological influences on his model are coherent with each other.

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[1]Gilkey's view of science and theology are presented together because of the format of chapter 2 on Torrance. Unlike with Torrance, there is a contrast between Gilkey's views of science and theology. However, one is a suitable introduction to the other. This is because any model for the use of science in theology involves some interpretation of science which is influenced by some model of theology.

The Nature of Science

In this section, Gilkey's view of science is surveyed in preparation for a later study of his view of the use of science in theology. This survey includes (1) his high view of science, and (2) his views of the limits of science.

The High View of Science

Gilkey's model for the use of science in theology is influenced by his high view of science as knowledge and as a cultural force. First, science is a form of theoretical knowledge (which Gilkey usually identifies with natural science).[1] As such, the use of science in theology should not be rejected because science provides real knowledge. The reality of scientific knowledge is evident in science's power of prediction and its power to shape reality.[2] In fact, science "is our most reliable and, on one level, our most fruitful way of knowing."[3] "Science has provided our

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[1]Gilkey discusses scientific explanation, formation of natural laws, empirical and scientific method, truth and falsification (*Maker of Heaven and Earth,* 16ff., 71ff., 121ff., 130, 149-151). See D. W. Musser, "Sovereigns Past and Present: The Sciences and the Religious in the Theology of Langdon Gilkey," in *The Theology of Langdon B. Gilkey* (1999), 221-238.

[2]*Nature, Reality, and the Sacred,* 70. Science has two creative roles: (1) knowing what is the case in our world; (2) resolving practical problems by applying this knowledge (*Religion and the Scientific Future,* 123; also 83).

[3]Ibid., 15. "For the purposes of understanding this

main and now our sole *cognitive* relation to nature."[1] Thus, science is "the normative mode of knowing the space-time world and its history."[2] "It is a dogma of our time that our only way to know is through science, and so nature is as the relevant sciences define nature."[3]

Second, the dominant definition for science in Gilkey's writings is science as *Weltanschauung*--a cultural force

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material and sensible world, the method of empirical science is our most accurate and dependable tool" *(Maker of Heaven and Earth,* 129).

[1]*Nature, Reality, and the Sacred,* 144. "All our 'factual' questions about the created world of nature are scientific questions and with regard to these questions, scientific inquiry represents the ultimate court of appeal. . . . For the Christian as for the secularist, scientific method is the most dependable avenue to truth. Truth about the observable character, structure, processes, and facts of the created world, and truth about its development in history, is scientific truth-it is not 'religious truth'-for its concern is God's creation, not God and His activities" *(Maker of Heaven and Earth,* 129-130).

[2]*Religion and the Scientific Future,* 18. "Henceforth, for any person accepting science as providing the normative mode of knowing the space-time world and its history--and this included most members of the intelligentsia, even we ourselves [theologians]--this verdict of the scientific community about divine revelation and biology effectively removed religious truth from the area of matters of fact" (ibid.).

[3]*Nature, Reality, and the Sacred,* 144. It is through science that we assume that we know what nature is (ibid.). "Organized empirical inquiry . . . has shown itself able to give us verifiable and useful knowledge of the significant factors operative in all classes of natural and historical events. It seems, therefore, to reveal, better than any other mode of knowing, what is both real and true in existence" (*Religion and the Scientific Future,* 36).

which provides society and theology with a world view. Therefore, the theological use of the logic, epistemology, and methodology of science cannot be separated from the concept of science as a cultural force.[1] Gilkey regards science as "the most important formative factor in creating what we call the modern Geist . . . or spirit." It has also produced a modern "love or eros for the truth," "human authenticity," and "spiritual existence."[2] In addition, the scientific method itself points toward elements of religious ultimacy.[3] As a result, for Gilkey, the "scientific story

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[1]Langdon B. Gilkey, *Society and the Sacred: Toward a Theology of Culture in Decline* (New York: Crossroad, 1981), 77-77; hereafter cited as *Society and the Sacred.*

[2]Ibid. A most crucial attribute of modern science has been its capacity for new knowledge. It has, therefore, developed a critical relation to tradition and a tolerance of the unorthodox. From this has arisen a new understanding of man and woman as capable of controlling natural forces, of remaking their social and historical worlds, and thus of history as a realm of promise. Science has given to human beings a new consciousness of their own freedom in nature and in history, and out of this new self-awareness has come the buoyancy and the hope for the future (ibid.).

[3]Science is based on *commitment* to knowledge, belief in order, passion for integrity, beauty, order, simplicity, and evidence. Science is faith seeking understanding (*Nature, Reality, and the Sacred,* 38, 51). Questions on Gilkey's view are raised by Frederick Ferré ("A Renewal of God Language?" *Journal of Religion* 52 [July 1972]: 286-304), G. Stanley Kane ("God Language and Secular Experience," *International Journal for Philosophy of Religion* 2 [Spring 1971]: 78-98), and J. Wesley Robbins ("Professor Gilkey and Alternative Methods of Theological Construction," *Journal of Religion* 52 [January 1972]: 84-101). For Gilkey: (1) ultimacy does not appear directly; (2) its apprehension is

is part of the theological story of creation."[1] Science is a way to experience the ultimate dimension of God.[2] It is the most important cause of the most important changes in theology.[3]

In summary, Gilkey's model for the use of science is influenced by his high view of science as knowledge and as a cultural force. He recognizes that science has limits. However, as will be documented in the next section, he views the limits of science as facilitating its use in theology.

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intuitive not logical; (3) ontic analysis needs ontological formulation and phenomenological analysis uncovers limit dimensions; (4) secular understanding does not adequately symbolize experience; (5) ultimacy is real but appears in negative guise; (6) religious use of language is needed, but not a separate religious language (Shea, 143-155).

[1]*Nature, Reality, and the Sacred,* 24. If Genesis is "essential to our faith, as biblical writers and churchmen alike have thought, how are we to understand its relation to the rest of our important ideas, especially to modern physical science and to metaphysical philosophy?" (*Maker of Heaven and Earth,* 17; Clifford, 72, n. 103).

[2]Langdon B. Gilkey, "Religious Dimensions in Science," in *Religion and the Scientific Future,* 35-64. "This is not faith in the strictly religious and . . . Christian sense. But it is a commitment in the sense that it is a personal act of acceptance and affirmation of an ultimate in one's life" (ibid., 50). See Ted Peters, "Theology and Science: Where Are We?" 331.

[3]*Religion and the Scientific Future,* 4. Science is a response to reality as well as a construction (*Nature, Reality, and the Sacred,* 75).

The Limits of Science

Gilkey also discusses the limits of science in connection with the use of science in theology. Because both theology and science have limits, science needs theology[1] and theology needs science. On the one hand,

> the Christian does not believe that the scientific method exhausts the whole realm of truth; but [on the other hand,] what is known according to scientific criteria is a valid part of the whole area of God's truth.[2]

For Gilkey, the limits of science, its need for theology, and usefulness to theology are evident in a number of ways. First, the foundations of science are religious

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[1]*Maker of Heaven and Earth,* 68; *Nature, Reality, and the Sacred,* 24. According to Gilkey: "The Royal Society was founded . . . with two purposes: first, to sing the glory and the praises of God; and second, to develop the understanding of nature so as to increase the well-being of humankind. I [Gilkey] would restrict it now to the second; I can't conceive in our age of the first one being an explicit aim of science, and I wouldn't want to fault them for not doing so. In fact I don't think it could be done without falling into the trap of the Creationists. I spent most of my time in Arkansas arguing that science was *not* involved in the theological enterprise, which was what the Creationists were trying to make science do" ("Theology and Culture: Reflections on the Conference," *Criterion* [1989]: 5). Gilkey also realizes that his view of science is different from the actual practice of scientists. He argues that what scientists "intend to do," not what they do, that "sets up the criteria" of science (Langdon B. Gilkey, "Theology and Culture: Reflections on the Conference" [Given in L. Gilkey's Honor, April 14-15, 1989], *Criterion* 28 (1989): 5); hereafter cited as "Theology and Culture."

[2]*Maker of Heaven and Earth,* 129.

and mythical. Like theology, science rests upon faith. It must appeal to foundational but unproved assumptions.

> The activity of knowing points beyond itself to a ground of ultimacy which its own forms of discourse cannot usefully thematize, and for which religious symbolization is alone adequate.[1]

The experience of the ultimate appears in presuppositions and preconditions of science.[2] This "'religious' dimension . . . is not observable by the scientific method."[3]

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[1]*Religion and the Scientific Future,* 41. "No *truth* about God's creation can be antithetical to Christian truth. The same God who created the world has revealed Himself in Jesus Christ" (*Maker of Heaven and Earth,* 129-130). Science "cannot represent all we know" (*Nature, Reality, and the Sacred,* 41; Raymo, 31).

[2]The uncovering of the presuppositions/preconditions of knowing and their thematization is a matter for theology, for religious/mythical discourse. The foundations of knowing involve a region of mystery where assertions are based more on intuitions and faith than argument (*Religion and the Scientific Future,* 63-64). Here we reach beyond ordinary, univocal claims of reason to a level of ultimacy, of the unconditioned, "a whiff, if you will, of the sacred" (ibid.). The sacred is "that which is ultimate, healing, and normative for us, and that which gives meaning to the chaos of our life" (ibid., 76).

[3]*Maker of Heaven and Earth,* 130. Science cannot deal with universal factors like God. Yet God is implied in every science (ibid., 130-131). "Theological doctrines are not of the same order as scientific hypotheses. For if true, theological doctrines . . . necessarily hold of all events alike. . . . [They] hold of all events equally, since they concern the necessary and essential structure of things" (ibid., 140, n. 14).

Scientific theory and method make use of fundamental judgments based in self-accrediting insight.[1]

Second, there is no absolute dichotomy between scientific theory and scientific method. At the fundamental level, scientific theories are not objectively verifiable but they are grounded in other theories which are accepted by faith.[2] This is because the relations between human

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[1]The rules and criteria of knowing, the paradigms and models by which we think, are supported by personal belief and community affirmation. Our most fundamental judgments are not determined by objective rules. They are determined by self-affirmation of the rational consciousness as it is understood in our time and place (*Religion and the Scientific Future,* 55). The process of inquiry cannot move forward unless it steps somewhere on firm ground, and that ground is the virtually unconditioned character of contingent judgments and our unconditioned affirmation therein of ourselves as knowers (ibid., 61-62; also 59). "No sincere Christian can drive his hydromatic automobile to the doctor's office at one moment and deny the validity and relevance of science the next" (*Maker of Heaven and Earth,* 129).

[2]*Religion and the Scientific Future,* 54; *Nature, Reality, and the Sacred,* 68-69. In spite of Gilkey's reference to a fundamental level, there are similarities with the non-foundational philosophy of Quine in terms of a web/field of belief. W. Quine, "Two Dogmas of Empiricism," in *From a Logical Point of View* (Cambridge: Harvard University Press, 1953), 20-46. Gilkey comments that many 'objective' criteria have been suggested as to how basic hypotheses, laws, and paradigms are confirmed. "While these represent, to be sure, genuine attributes of valid scientific theories, a careful analysis shows that they turn out to be discoverable attributes of theories which we *already* believe to be true or the fruitfulness of which normal science has long since illustrated, rather than criteria which can be objectively used to determine the validity of a new and as yet unestablished theory" (*Religion and the Scientific Future,* 54).

minds and the universe are a presupposition of both science and theology.[1]

Third, science is unable to deal with the world as a whole, as theology does in the doctrine of creation.[2] Thus science is of no help in the human search for meaning and it regards human freedom as an irrational concept.[3]

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[1]Ibid., 51-53. Method is always theory laden. Experience is intelligible only in relation to a *method*, and data are relevant only in relation to some presupposed *theory*. It is wrong to "seek to establish the link between mind and universe *scientifically*, as an inference from scientific data and as implied by scientific theories and formulas; . . . [to] look to the conclusions of science for that link, rather than to the conditions of science" *(Nature, Reality, and the Sacred,* 68).

[2]"Scientific hypotheses and statements are thus by definition *about* relations between finite things in time and space. They assume that the process of events in space and time is already going on, and they ask about their character and the laws of their interrelationships" (*Maker of Heaven and Earth,* 25). "Science can therefore inform us about the character and development of the world that God has created, but it cannot and does not seek to study the event by which the whole process came into being. Because they have reference to events on two entirely differently levels of being, the inquiries of science and the theological doctrine of creation cannot conflict" (ibid., 55).

[3]A scientific "understanding of structure finally gives us no help in the search for meaning. For let us notice that in so far as it achieves complete success, a 'how' explanation eradicates freedom and purpose from the event it seeks to comprehend. To the scientific inquirer, freedom can only represent an irrational element, because it is not totally explained by the necessary and invariable structure of relations that science seeks. Correspondingly, purpose and meaning cannot be a part of a 'scientific' explanation; inevitably they involve freedom, and freedom, which is moved by intentions, is by its nature not a necessitated, impersonal and invariable reality" (ibid., 68; also *Nature,*

Fourth, theology is, on a different level from science, a reliable way of knowing.[1] For Gilkey, science and theology are "mutually interdependent" with regard to relations between their types of truth.

> [F]or both science and religion . . . the question of the relation of each to reality, of the truth each holds, is crucial—for both essentially represent a relation to reality that is cognitive or believed to be so. And thus, because science and religion are mutually interdependent, the issues of the truth of science and the truth of religion and of the relations between these sorts of truth represent fundamental concerns for each.[2]

In this section on the nature of science, Gilkey's view of science has been surveyed in terms of his high view of science and his views on the limits of science. Science is limited in that (1) it has non-scientific/religious foundations, (2) some of its theories are grounded in faith,

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Reality, and the Sacred, 24).

[1]For Gilkey's summary of his argument see *Nature, Reality, and the Sacred,* 111-112. He writes: "I fault the scientists . . . for misunderstand-ing science, . . . for claiming to be the only way that reality is known" ("Theology and Culture," 5). "There is something beyond both science and the humanities that undergirds them both. This is a long, long discussion—almost everything I write tries to carry it on" (ibid.). Scientific "cognition takes place at . . . levels that are mutually distinguishable . . . [and] mutually dependent . . . [which] interpenetrate to form one experience. . . . And involved with all of these levels as intrinsic to their possibility are our intuitions of reality as a whole and of the sacred" (*Nature, Reality, and the Sacred,* 40).

[2]Ibid., 11.

(3) it cannot deal with the whole world, and (4) theology provides real nonscientific knowledge.

However, there seems to be an element of incoherence in Gilkey's discussion.[1] On the one hand, he holds that science is our only way of cognitive relation to nature. Science is the normative mode for knowledge of nature. This means that nature is as science defines it. Science also is a way to experience God and God's truth. On the other hand, Gilkey holds that theology provides real knowledge and that science cannot deal with nature as a whole as does theology. Thus for him, the kinds of truth addressed by science and theology are interdependent and this relationship is a fundamental concern of both disciplines.

The next section of this study explores Gilkey's view on the nature of theology and its influence on his model for the use of science in theology.

The Nature of Theology

Now that Gilkey's view of science has been surveyed, the nature of his model for theology and, therefore, for the use of science in theology will be described. This will be done in terms of his description of the influence of the study of nature (Natural Theology), Scripture (Bibliology),

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[1]See earlier sections in this chapter on The High View of Science and The Limits of Science.

and Christ (Christology) on his model for the use of science in theology. First, the influence of Natural Theology will be described. Then the coherence of that influence with his Bibliology and Christology will be explored.

Natural Theology

The cosmological nature of Gilkey's model for the use of science in theology is implied in his description of the place of Natural Theology in his empirical theology.[1] He regards theology as empirical even though it does not deal with "'matters of fact,' with assertions about creatures or events in space and time, as do physical or historical science."[2] As a result there is a need for category translation of theological language into the categories of science in order to show empirical relevance of theological language. While the factual element of mythological language can be studied by historical science, the element

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[1]"The theological crisis . . . [involves] the present demand for an 'empirical' approach to theology, a paradoxical demand in so far as such an approach is both required and difficult in our time" ("New Modes," 345; also 346). A second element of the theological crisis "centers on the question . . . of the meaning of the symbol 'God'" (ibid., 345). "In a secular culture only what is in coherent relation to ordinary life, life six days a week, bears for us the stamp of meaningfulness and of validity" (ibid., 346). Theology cannot afford to be "suspended high above experience and therefore in the end vulnerable to positivistic and existentialist attack" (ibid.).

[2]Ibid., 347.

of symbolic religious knowledge in no way contradicts what historians know through science.[1] Rather, "it supplements it. . . . The Christian . . . can thus be both a scientist and a Christian, with a sense neither of fear nor of conflict."[2]

Because of this Gilkey proposes a dialectical or "balancing theology" that seeks to correlate the creation with the Creator. This dialectic must start with ordinary experience.[3] Natural Theology is of great importance since theology has the same object as science: common experience.[4]

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[1]*Maker of Heaven and Earth,* 132-133.

[2]Ibid., 132-136. Religious symbols can "make no authori-tative assertions about concrete matters of fact" (*Religion and the Scientific Future,* 4). Factual certainty is a matter for scientific inquiry and not dogmatic or theological truth (ibid., 19; see Langdon B. Gilkey, *Catholicism Confronts Modernity: A Protestant View* [New York: The Seabury Press, 1975], 98; also Davis, 90). For Gilkey, religious facts are few. Science provides data. Theology gives meaning. Religious symbols are empty interpretive categories. In place of concern for miraculous revelatory happenings, there has appeared (1) a scientific historical inquiry into the events from which our religious tradition originated, (2) a contemporary phenomenological analysis of the religious dimension of our human experience, and (3) a scientifically, sociologically, and historically based projection of our future (Davis, 95-97).

[3]Langdon B. Gilkey, *Message and Existence: An Introduction to Christian Theology* (New York: Seabury, 1979), 10-11.

[4]*Nature, Reality, and the Sacred,* 9. Gilkey does not regard Natural Theology as the center or final criterion of theology, and he holds that it does not tell much about God (ibid., 193-196).

Gilkey recognizes a difference between science and theology in that theology is "an explication of common experience from the perspective of a religious tradition."[1] However, he suggests that the task of empirical theology "is to begin with immediate experience and to show therein the possibility[/ground] of metaphysics"[2] and thus, the ground of a philosophical Natural Theology.[3] This emphasis on immediate experience and Natural Theology informs Gilkey's model for the use of science in theology. He writes: "Science and religion are essential aspects of our common life, necessary for that life and for each other."[4]

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[1]*Message and Existence,* 7.

[2]"New Modes," 349. For Gilkey, modern metaphysics is unreal to today's consciousness as is theology based on revelation (ibid.). "If hermeneutical theology and [traditional] metaphysics each assume too much to help us, and if a theological use of language analysis is confined by the method of the language of the church, perhaps phenomenology's ability to examine in various ways the felt character of ordinary experience will provide a much needed 'secular' ground for theological language" ("Theology," 266). However, Gilkey's proposal of a referent for theological language in experience has been criticized as being as questionable as revelational theology. Also his connecting sentences between naming phrases and human experience are criticized as being as questionable as those of metaphysical theology (Robbins, 84-101).

[3]*Nature, Reality, and the Sacred,* 75-76. Metaphysical inferences from nature are developed in philosophical Natural Theology (ibid., 193-196).

[4]Ibid., 9.

Gilkey's cosmological interrelation of Natural Theology with the use of science may be surveyed in terms of (1) Natural Theology, (2) relations between creation and the Creator, and (3) between science, philosophy, and theology.

Characteristics of natural theology

The cosmological nature of Gilkey's model for use of science in theology shows up in three characteristics of his Natural Theology. First, a persuasive Natural Theology begins with science and articulates the various aspects of nature inclusively, as principles of experience, as categories of all entities, and as symbols of being.[1]

Second, by an act of faith, the power, life, order, and unity in nature are seen as traces of the sacred. Nature is a dynamic process moving from actuality to probability, increasing novelty, order, and value. The cosmos has a penumbra of mystery with sacred traces pointing to the source of life, death, and grace.[2] Thus, while Natural Theology does not prove God, it is the basis of all proofs.[3]

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[1]Ibid., 63, 66, 73.

[2]Ibid., 81, 128, 135, 151, 180-192. While theism demands faith, it is superior to theories which deny sacred traces in nature by reduction or contradiction of facts or save the facts at the expense of coherence (ibid., 175-176).

[3]Ibid., 193-196. Gilkey writes: "I have prided myself on being one of the leading opponents of natural theology. . . . And then I remember . . . trying to figure out what kind of a view of the processes of history was involved if

Third, for Gilkey, the use of science in Natural Theology leads to a view of God as

> the unconditioned power to be--yet present in each puff of existence; God is the transcendent ground of freedom--yet creative in each quantum jump as in each human decision; God is the eternal source of order and novelty, uniting the determined past with the possibilities latent in the open future.[1]

This third characteristic of Natural Theology points to a cosmological model for the use of science in theology in terms of the relation between creation and the Creator.

Creation and creator

The cosmological model for the use of science in Gilkey's philosophical Natural Theology is more than a preliminary apologetic moment which prepares the way for the acceptance of a Christian view of God. Rather, his theism is informed by his Natural Theology and thus by the cosmo-

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one was going to talk about Providence. I wrote that one had to have what I called an 'ontology of historical process,' or else one would just be asserting an empty symbol. . . . One might say that the diseases of Tillich [such as Natural Theology] were beginning to show" ("Theology and Culture," 3).

[1]*Nature, Reality, and the Sacred,* 203. Gilkey rejects translation of theories of science into theology (*Religion and the Scientific Future,* 38), but interprets evolution theologically. As orderly change requires a principle of order, so progressing change needs a principle of progressive order called "God" or the "evolutionary principle" (*Nature, Reality, and the Sacred,* 128). God creates in and through the providential story of evolutionary development (ibid., 100).

logical perspective provided by science. Gilkey writes: "I don't feel I know much about God independent of the world."[1]

Gilkey proposes a two-way relationship between the interpretation of human experience in Natural Theology and Christian theism. Therefore, "God can only be understood in relation to ourselves and our experience—just as the latter can only be made intelligible . . . in relation to God."[2]

As with his Natural Theology, Gilkey's theism begins from below with science. He argues that concepts of creation and providence express "the universal and necessary

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[1]"Theology and Culture," 4; also *Message and Existence,* 69-70. The God concept is filled with tensions which call for a special language (Langdon B. Gilkey, *Through the Tempest: Theological Voyages in a Pluralistic Culture,* ed. Jeff B. Pool [Minneapolis: Fortress *Press,* 1991], 70-74. Theologians walk a thin line between monism and dualism. Some emphasize the presence of God and the dependence of finitude on God, tending toward monism (Augustine, Luther, Schleiermacher, Tillich). Others emphasize the distinction between the transcendent God and creation and tend toward dualism (Thomas, Calvin, Barth) (ibid., 92; Walsh, 275). "God reveals God's self as a mysterious dialectic or polarity of being and nonbeing" (*Through the Tempest,* 98). "Being and nonbeing dialectically interpenetrate" (ibid., 99).

[2]*Message and Existence,* 70. Further, the "finitude characteristic of our being . . . our creatureliness . . . can be described . . . as the image or 'symbol' of God" (ibid.). Gilkey argues that in the past, science and religion failed to respect nature as an image of God. He comes close to identifying God with nature as our mother and creator. He paraphrases the dictum of Acts 17:28: "In nature we live and move and have our being." "Nature is source and ground of sacred power, life and order." However, he writes that God creates through nature's processes (*Nature, Reality, and the Sacred,* 150-153).

activities of God in relation to all creatures."[1] Thus, theism should reflect use of the conclusions of science and historical consciousness about the nature of creation.[2]

This is evident in that Gilkey introduces his theism with a discussion of creatureliness based on the human sciences as clarified in Natural Theology. These sciences show that, while we are like other creatures, we are unusual creatures. A clear sign of creatureliness is temporality. We are immersed in an ongoing temporal passage from past to present to future.[3] This temporality is characterized

> by two polar sets of categories: (1) *destiny*—what we and our world have been given and so what they are—and *freedom*—the capacity to shape both ourselves and our world into the future; and (2) *actuality*—what is now arising out of what has been—and *possibility*—what might be or become in the still undecided future.[4]

It is evident then that in Gilkey's Natural Theology, science illuminates how we as creatures image the Creator. First, like God, not only are we immersed in temporality but

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[1]*Message and Existence,* 87. Ontological or metaphysical characteristics of God as Creator and Ruler are universal (ibid., 69-70).

[2]Ibid., 88.

[3]Ibid., 70-74.

[4]Ibid., 74. "It is through . . . 'myth' that this tension between eternity and time is expressed in Christian thought" (*Maker of Heaven and Earth,* 259).

we transcend it with our minds and wills.[1] Second, temporality is "unintelligible unless it too reflects or manifests a ground, power, and order beyond itself."[2] Finally, "our social existence is itself saturated with a religious dimension and thus presupposes a dim awareness of this ultimate and sacral presence [God]."[3]

The influence of Natural Theology on his cosmological model for the use of science leads Gilkey to reject some aspects of what he describes as the traditional view of God. In his new version of theism, first, there is no sharp distinction of original creation and continuing providence. Creation takes place through the unfolding temporal process.[4] Second, like human beings, God is "positively related to the world and thus [is] affected by it."[5] Third,

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[1]*Message and Existence,* 74-76.

[2]Ibid., 78.

[3]Ibid., 81.

[4]Ibid., 90. There is no "sharp temporal distinction between God's creation of the world at an absolute beginning . . . and his/her subsequent providential rule over a fully established and formed world. Creation is seen now to take place throughout the unfolding temporal process, for new forms of life and of institutions were now seen continually to appear during that process. If God creates at all, therefore, he/she creates over time; thus creation and providential rule seem to melt into one another" (ibid.).

[5]Ibid., 94.

therefore, "God shares in both the temporality and the changeability of his/her creatures."[1]

The influence of Natural Theology on the cosmological nature of Gilkey's model for the use of science in theology is evident even in his defense of his theism as biblical. While he regards his theism as non-traditional, he argues that it is consistent with the witness of Scripture[2] for several reasons. First, his proposals do not imply that God is finite/contingent.[3] Second, he argues that God possesses the attributes of creation in a different way than does the creation.[4] Third, nontraditional theism may be coherent with traditional language about God since the mystery of God implies that theological language is symbolic.[5]

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[1]Ibid.

[2]Ibid., 95-96. See also section on Bibliology below.

[3]"As the source of all over time—and thus *in* time—God is not contingent but necessary in being; as the uniting principle of past, present, and future—and thus *in* time—God transcends temporality; as the actuality envisioning the infinite realm of possibility—and this sharing in potentiality—God is infinite" (ibid., 96).

[4]Gilkey regards the nature of God as personal and mysterious. This is in spite of the fact that Gilkey begins with Natural Theology and concludes that God appears only through the creation (ibid., 97-102).

[5]"Our words about God are not literal, direct, or univocal . . . because of the divine transcendence; also . . . they are not empty, meaningless or 'equivocal' because of the essential and recognizable activity of God in the world of our experience. Rather our words are analogical or symbolic" (ibid., 102). He writes of "a rather significant

The cosmological nature of Gilkey's model for the use of science in theology has been presented in terms of the implications of the characteristics of Natural Theology and the relations between creation and Creator. The nature of his model is further explored in the next section on relations between science, philosophy, and theology.

Science, philosophy, and theology

The cosmological nature of Gilkey's model for the use of science in theology is explicitly outlined in his view of interlocking relations between science, philosophy, and theology in his Natural Theology. Gilkey proposes

> that our cognitive life be conceived as composed of three interlocking but distinct hermeneutical inquiries: science, philosophy (ontology or metaphysics), and (philosophical) theology.[1]

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change in my thinking: a movement from radical transcendence and separation—emphasizing the freedom of God—to immanence and the universal presence of the divine" ("Theology and Culture," 3).

[1]*Nature, Reality, and the Sacred,* 75-76. "Why, then, all these past conflicts? The answer lies, at least partially, in the fact that the various kinds and levels of truth—scientific, philosophical and religious—have become self-consciously and explicitly distinguished from one another only slowly in the history of culture. All that early man felt to be the 'truth' he expressed in unified form as his religious myths or 'stories of the gods.' These myths combined answers to all three types of questions we have discussed: they are at once the prescientific 'science,' the prerational 'philosophy,' and the primitive theology of ancient man" (*Maker of Heaven and Earth,* 31-32).

This means that, first, both philosophy and theology use cosmological structures provided by science as a starting point. Theology seeks "the meaning of the structures provided by the sciences." Its "fundamental symbols" are explicated "in terms of the sciences."[1]

Second, the influence of Natural Theology on the cosmological nature of the model for the use of science in theology is clarified by Gilkey's distinction without dichotomy between science and theology. On the one hand, the distinction is very important. He views it as a serious

> theological-philosophical error . . . to regard religious knowledge as identical or even similar to scientific knowledge, as theoretical information about both material and historical matters of fact.[2]

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[1]*Nature, Reality, and the Sacred,* 76. "Theology, on the basis of one perspective on existence, seeks the meaning of the structures provided by the sciences and envisioned by philosophy. Its fundamental symbols are drawn from its own religious tradition, in dialogue with other traditions as well as with all else in cultural life; but its explication of these symbols is in terms of the sciences, the philosophies, and the theologies of its time and place (i.e., in terms of the structure of existence as that is then understood)" (ibid.). In contrast, "Science seeks on the basis of some preunderstanding the invariant structures of specific ontic processes, and it appeals to sensory, quantitative data for both its materials and its forms of validation. Philosophy seeks (from some chosen perspective) the universal structures of all that is, and it appeals to the entire width of experience; philosophy thus criticizes, formulates and reformulates the principles presupposed in science and all the arts" (ibid., 75-76).

[2]Ibid., 12. For Gilkey, science and theology differ in data, evidence, areas of experience, intelligibility, explanation, authority, and symbols (ibid., 75). The world

On the other hand, in Gilkey's Natural Theology there is no dichotomy between science and theology. There is an interlock of science and theology which belongs to the realm of ontology and metaphysics, namely philosophy. Gilkey writes of "a philosophical common ground," "a necessary epistemological and ontological or metaphysical middle ground" or "middle wasteland" between science and theology.[1] Significantly, science (not theology) clarifies the middle ground between itself and theology and therefore contributes to the unity of science and theology.[2]

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views of science, as in classical philosophy, are in the broadest sense trans-scientific world views which are yet central to science (ibid., 11). They point toward "the possibility of ontological analysis-- . . . beyond science--[which] does not guarantee a universe in which religion is credible . . . [but] does provide the possibility of such credibility" (ibid., 75). "As both Whitehead and Tillich show, [given] an ontological analysis of actuality in which self and world represent participant polarities [then] . . . religion as a response to reality as well as a human construction (as science is a response as well as a construction) becomes intelligible--and a philosophical theology is well underway" (ibid.). Science and theology are understood when their theories are understood in light of their own terms and evidences, and then assented to as probable or rejected as false (ibid., 41).

[1]Ibid., 4-44. "I [Gilkey] am interested (as I was in most of *Religion and the Scientific Future*) in the points where both science and religion meet. . . . [There] many, though not all of the misunderstandings and problems in the relation between science and religion lie" (ibid., 43-44).

[2]"An intelligent and self-consistent science points beyond itself to an ontological or metaphysical ground, to an analysis of actuality as inclusive of self and world, subjectivity and objectivity, purposes and causation. . . . Such an analysis can . . . provide the necessary theoretical

While he rejects the identification of science with theology, Gilkey's Natural Theology proposes an interpenetration between them. He concludes that the symbols of structure, of meaning, of the good (as guide for action), and of fulfillment and hope, all interpenetrate one another in a coherent whole.[1] There are uses for science in theology in that it is necessary to interpret theologically the future of science in terms of freedom, sin, judgment, renewal, and fulfillment. Within a scientific culture, dilemmas may be explained, destiny may be thematized, and confidence in the future may be grounded in theology.[2]

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point of unity between the cognitive disciplines and the other important aspects of human communal life that are now subordinated to, if not excluded from, the universe as pictured by scientific realism" (ibid., 74).

[1]Ibid., 10-11. "The inquiry into matters of fact, the observable structures of the spatiotemporal continuum, being the domain of science; the inquiry into the fundamental hence universal structures of knowing itself, and so of the finite being which is known, being the task of transcendental analysis and of ontology; and finally the explication of the horizon of ultimacy, the mystery and tragedy of freedom and the sacred grounds of confidence and hope, being the task of religious myth and of theology" (*Religion and the Scientific Future,* 125-126).

[2]For Gilkey, a study of the use of science reveals that if we are to understand our future in the light of science we must move our reflection and language to deep issues: to the relations of an increased human power and freedom, to sin, judgment, and the promise of renewal and fulfillment. We must begin to think of the entire eschatological scope of the work of divine grace in history. The dilemmas of secular cultures are ultimately intelligible only in the light of faith. The destiny of a scientific world can be adequately thematized only in terms of religious symbols.

In summary, the cosmological nature of Gilkey's model for the use of science is evident in his use of Natural Theology as a prolegomena to Positive Theology.[1] In brief, Natural Theology makes theism credible as well as nontraditional. Gilkey describes the interrelation of science and theology in terms of interpenetration on all levels and in terms of distinction without dichotomy.

There seems to be a point of incoherence in Gilkey's cosmological model. This has to do with his suggestion, on the one hand, that theology is empirical because its object, like science, is common experience. On the other hand, Gilkey holds that theology does not deal with matters of fact. The tension is highlighted by Gilkey's personal testimony that he does not know much about God independent from the world. What he seems to mean is that theology does not normatively establish matters of fact. Instead, this task belongs to science. However, Gilkey goes even further to give to science the task of clarifying the philosophical middle ground between itself and theology. This seems to

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The confidence for the future of technological man can be creatively grounded only if the coming work of the Lord in the affairs of men is known and affirmed (ibid., 99).

[1]This term here is used to identify theology produced in response to a community's apprehension of divine revelation. Brian Walsh refers to three aspects of Gilkey's theology: prolegomena, positive/constructive theology, and a theology of culture (Walsh, 27).

give to science an unwarranted dominance over theology not only with regard to the establishment of the facts but also with regard to the trans-scientific interpretation of the facts.

The next section explores and evaluates the coherence of Gilkey's cosmological model in terms of the influence of the study of Scripture on his model for the use of science in theology.

Bibliology

That bibliology is an element in Gilkey's model for the use of science in theology is evident in his claim that Scripture is the "primary and normative source"[1] for his empirical theology. This section explores how the influence of Gilkey's Bibliology on his model for the use of science in theology coheres with the cosmological nature of his model which is controlled by his Natural Theology.

Gilkey's cosmological model for the use of science in theology involves a tension between the primacy of Scripture and the primacy of the starting point of theology in Natural Theology.[2] This tension becomes apparent when one considers Gilkey's views about: (1) biblical theology as hermeneutical

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[1]*Message and Existence,* 54. See discussion of the primacy of Christology in the section on Christology below.

[2]See section above on Natural Theology.

discipline, (2) the relations between biblical and systematic theology, and (3) between community and revelation in Scripture.

Biblical theology as hermeneutical discipline

The function of Bibliology in Gilkey's cosmological model for the use of science is illuminated by his view of hermeneutics. He suggests that the traditional approaches to theology should be replaced by a theology of hermeneutic phenomenology.[1] This hermeneutic is cosmological in that it is defined as "the enterprise of understanding the totality of contemporary experience [including science] . . . through the forms of or in the terms of Christian symbols [including Scripture symbols]," as in his Natural Theology.[2]

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[1]*Naming the Whirlwind,* I, 6-II, 2; also "New Modes," 354-366. "Phenomenology, in the existentialist form represented by Heidegger, has . . . been a force in Protestant theology for some time, through Bultmann and his various descendents. . . . Quite recently, however, phenomenology has been used by men in contemporary philosophy concerned with the character and meaning of religious symbols, and their relations to the character of actual experience, to the *Lebenswelt* in which man actually lives" ("Theology," 265-266).

[2]*Reaping the Whirlwind,* 134. "Christian faith is the effort to live one's life in the illumination and power of those symbols and the presence of deity they mediate" (ibid.). Hermeneutics here is more than interpretation of texts (ibid.).

The implications for the use of science in Gilkey's linkage of his biblical hermeneutics with his cosmological "theological hermeneutics" in Natural Theology may be clarified in terms of four levels of meaning: (1) eidetic, (2) experimental, (3) onto-logical and philosophical, and (4) ethical and political.

On the one hand, at the first eidetic level of meaning, Gilkey's Bibliology seems to have potential for significant impact on his model for the use of science in theology. This is because the first step for the interpretation of religious symbolism (including biblical symbolism) is to clarify its eidetic or historical meaning. This is the intrinsic meaning which the symbolism had in the Christian community in its own time; its own unique and historically conditioned apprehension of the sacred. This includes a vision of the symbolic picture of God and His relation to humanity and the world.[1] On the other hand, Gilkey's Bibliology is cosmological in that it is influenced by his use of science in Natural Theology. As a result, it seems that the eidetic meaning of Scripture is reinterpreted in

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[1]Arguments for the importance of eidetic meaning are developed in ibid., 140-143; *Naming the Whirlwind,* 458; *Catholicism Confronts Modernity,* 115-121. See the survey given in Clifford, 166-206.

ways which are contrary to traditional views of special revelation.[1]

Gilkey's Bibliology is influenced by his cosmological use of science in Natural Theology to clarify the finite medium of revelation. This is evident in that the second experimental level of hermeneutics involves a theological prolegomenon or Natural Theology which is influenced by the use of science.[2] Similarly, at the third ontological/ philosophical level of hermeneutics, the meaning of religious symbols must be expressed through category

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[1]"Symbols, Meaning, and the Divine Presence," 256-259. For Gilkey, revelation is mediated cosmologically on three levels: (1) in and through the finite which becomes its true self as a medium of divinity; (2) in a particular form to a historical community making it aware of its own symbolic status as existing in and through divinity; and (3) over time (as in Scripture) to the continuing community founded on special revelation (originating revelation other than Scripture) (ibid.).

[2]*Reaping the Whirlwind,* 144; *Naming the Whirlwind,* 467-70; *Catholicism Confronts Modernity,* 122-123. This involves a phenomenology of experience, including scientific experience. This procedure uncovers the religious dimension to which the religious symbols are an existential response. This is what Gilkey, following Tillich, calls a "theology of culture" (Langdon B. Gilkey, "Preface," *Society and the Sacred,* ix; Clifford, 207; Paul Tillich, *Systematic Theology,* vol. 3, *Life and Spirit, History and the Kingdom of God* (Chicago: University of Chicago Press, 1963), 57. According to Gilkey, Tillich identifies God with Being, the ground of all finitude and so the foundation of the whole range of common human experience ("The Role of the Theologian in Contemporary Culture," in *The Thought of Paul Tillich,* ed. James Luther Adams, Wilhelm Pauck, and Roger Lincoln Shinn (San Fransisco: Harper and Row, 1985), 330.

translation in modern/credible[1] ontological categories informed by science. True theological categories must touch our world as we experience it and reflectively apprehend it in science.[2] Similarly, at the fourth ethical/political level of hermeneutics, the meaning of religious symbols must not be added *ab extra* but must be intrinsic to the science-influenced interpretation given to them.[3]

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[1]On the one hand, "rational" denotes truth which may be known in science. Thus, one way theology "is validated . . . [is] insofar as it is able to elaborate its symbols into intellectual categories expressive of the foundations of [scientific] inquiry" ("New Modes," 368-369). Since there are problems with metaphysics in contemporary thought (ibid., 348) the task of theology is to begin with experience and to show therein the possibility of metaphysics (ibid., 349; also 351-369). On the other hand, "credible" denotes truth which is acceptable on other than "rational" grounds. However, the rational and the credible are interrelated and disappear if they are separated (Langdon B. Gilkey, "The Dialectic of Christian Belief," in *Society and the Sacred,* 26-39; *Reaping the Whirlwind,* 146-147, 155; Clifford, 185-191). Gilkey holds that Natural Theology is rational only to those who find Christian theology credible. Any overall rational pattern is at best an abstraction or ideology. He mentions Kierkegaard's view (*Concluding Unscientific Postscript* [1846]) of the rationality of Christianity as a total system of symbols and a qualification of human existence (*Society and the Sacred,* 26-39). See *Catholicism Confronts Modernity,* 156, 158, 160-167, 170. He also draws on Polanyi's (*Personal Knowledge,* Part I, 3-65) personalist approach to scientific knowledge (*Nature, Reality, and the Sacred,* 45; *Religion and the Scientific Future,* 41).

[2]*Reaping the Whirlwind,* 145.

[3]Ibid., 146. The use of science is more obvious in levels 2 and 3. However, Gilkey's theology manifests a use of science on all hermeneutical levels.

Gilkey proposes a temporal/historical priority of the eidetic or biblical level of meaning over other levels of meaning. This eidetic/biblical level of meaning is to be identified first. However, the cosmological nature of his model for the use of science leads to a qualification of that priority in terms of a certain cosmological priority of systematic theology, which is influenced more by Natural Theology than by biblical theology. This leads to a reinterpretation of the eidetic meaning of Scripture and undermines the claimed primacy of biblical theology.

Biblical and systematic theology

The previous section described the influence of Gilkey's Natural Theology on his use of science to qualify the primacy of the eidetic meaning of Scripture. The same cosmological qualification of biblical primacy is evident in his discussion of biblical and systematic theology. On the one hand, biblical theology states what the biblical writers meant to say in their own terms, cosmological, historical, and theological. This is the level of eidetic meaning. On the other hand, systematic theology states what the word might mean for us today, what we can believe to be the truth of God and His action in light of scientific perspectives.[1]

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[1]"Cosmology, Ontology, and the Travail of Biblical Language," 204.

There is a tension between Gilkey's references to both biblical and systematic theology as both having primacy. Despite his reference to the sense in which eidetic meaning is primary, for Gilkey, biblical theology (where the use of science in Natural Theology is less obvious) does not have final primacy over systematic theology (where the use of science in Natural Theology is more obvious).[1]

On the one hand, for Gilkey, there is a sense in which there is a science-influenced cosmological priority of systematic/positive theology over biblical theology. This is evident when he includes the latter within the former along with Natural Theology. Therefore, there are three stages of theology: (1) Natural Theology, (2) Biblical Theology, and ultimately their correlation in (3) Systematic or Positive Theology.

> [First,] The prolegomenon [Natural Theology], a phenomenological hermeneutic of secular experience. . . . Second there is the eidetic analysis (or in another sense of that oft-used word, a "hermeneutical" analysis) of the community's symbols, both biblical and traditional. . . . Finally, systematic theology is the mutual interpenetration ("correlation" was Tillich's term) of experienced questions and symbolic answers, the one being the means of understanding the other.[2]

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[1]Ibid., 204-205.

[2]"New Modes," 366-367.

On the other hand, Gilkey seeks a cosmological balance of the different priorities of Natural Theology, biblical theology, and systematic theology as parts of one task, namely theological construction.[1] Again, this cosmological balance is influenced by Natural Theology and the use of science. He argues that

> there is no primary discipline in the life of the church, for all of us . . . live and think in the [scientific] present and look for truth in documents from the past [such as Scripture].[2]

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[1]"Theology and Culture," 4. Gilkey contrasts his position with Tracy's separation between analysis of common experience and the interpretation of Christian symbolism (*Reaping the Whirlwind,* 373). He writes: "Schleiermacher is right: we experience God . . . through the mediation of the world around us. . . . I realize that *Reaping the Whirlwind* and *Message and Existence* try to carry that theme out" ("Theology and Culture," 4). Jeremy Driscoll suggests that "at definitively critical points Gilkey develops his position either in conjunction with Tracy or in contrast to him" (58). For example: "whereas with Tracy the two analyses [of common existence and of the contents of faith] are relatively independent endeavors. . . . [Gilkey] stipulates (1) that 'common human experience' is not to be understood except in abstraction until it is comprehended by means of the symbols derivitive from the Christian fact, nor (2) are these symbols appropriable by modern minds until they have been reinterpreted in the light of 'common modern experience.' Thus . . . 'correlation' . . . [is] at the level not either of prolegomena nor of fundamental theology, but only at the level of constructive theology when the entire spectrum of Christian symbols is applied interpretatively to the entire width of 'common human experience'" (Driscoll, 60).

[2]"Cosmology," 204-205. Gilkey also refers to a rough parity of various religions and their revelations and Scriptures ("Plurality: Christianity's New Situation," in *Through the Tempest: Theological Voyages in a Pluralistic Culture,* ed. Jeff B. Pool, 21-34 [Minneapolis: Fortress

> [Thus,] for all of us, a contemporary understanding of the Scriptures depends as much on careful analysis of our present presuppositions [influenced by science] as it does on being learned in the religion and faith of the past.[1]

Gilkey proposes a parity of biblical and systematic theology in the linking of the polar perspectives of God and humanity.[2] The concept of parity is influenced by Gilkey's Natural Theology and his cosmological model for the use of science. This influence may be further clarified in terms of relations between community and revelation.

Community and revelation

The Natural Theology qualification of the primacy of the eidetic meaning of Scripture is illuminated by Gilkey's view of relations between community and revelation. This is

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Press, 1991]).

[1]"Cosmology," 204-205. Unless we have a concept of how God acts in ordinary events, we cannot know what is meant by God's unique acts. Therefore, intelligible theology depends on cosmological and ontological inquiries (ibid.).

[2]For Gilkey, theology is reflection on human existence and on the world in which we live from the perspective of the faith (as Ritschl suggests). It is also a reflective explication of the contents of faith (as Tracy suggests). Natural Theology validates doctrine by human experience. Apologetical theology insists that theological symbols cannot be understood or appropriated except in correlation with ordinary experience. God and man are understood only in light of one another. Theology is interrelation between human experience and divine revelation, human creaturely being and God's presence and action (*Message and Existence,* 7-11, 13-14).

because, in his Natural Theology, the development of a constructive Christian theology calls for a

> correlation between our human existence and history and Christian revelation, between our ordinary experience of self and community and the symbols characteristic of the Christian tradition.[1]

This aspect of Gilkey's Natural Theology begins from below (with the nature of community as viewed by science) in the articulation of his view on revelation. He proposes an interrelation of human community and divine revelation.[2]

The influence of Natural Theology on Gilkey's model for the use of science in theology in terms of the relation of community and revelation is evident in the following survey. First, symbolic forms exist only in actual communities in the world reflected upon in Natural Theology.[3] Second, even the secular community of science reflected upon in Natural

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[1]Ibid., 8; Clifford, 70.

[2]*Message and Existence,* 40-43.

[3]Belief in symbolic forms structure the perspectives, the norms, and thus the life of objective historical communities (ibid., 25). There are scientific, theorizable, and philosophical elements within such a symbolic structure. However, the structure as a whole is *symbolic* rather than *theoretical* (ibid., 27). "To be a scientist means also to participate in the quite definite ethos (the 'scientific spirit') of a tradition borne by . . . the community of scientists. . . . Only the *procedure* ('method') of inquiry in to what is taken to be real in experience is regarded as determinative of this community's shared life and must be accepted and affirmed if one is to participate" (ibid., 28).

Theology tends to take on a religious symbolic form.[1] Third, the ordinary symbolic form of a community does not in itself constitute revelation apart from the world studied by Natural Theology.[2]

The cosmological influence of Natural Theology on Gilkey's model for the use of science is also coherent with his view of the nature of revelation. First, as indicated in the previous paragraph, Gilkey distinguishes between ordinary experience, symbolic form, and revelation.

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[1]Science claims "to be *ultimate* in character, to possess the *truth* about history, society and human existence, and thus to represent *the* essential message, center, and goal of history" (ibid., 29). "There is in each cultural vision an unconditional dimension of the ultimate and the sacred, that gives power, form, and meaning to the life lived in that society" (ibid., 29-30). There is also a "principle of individual and personal participation" in community, "the principle of autonomy" (ibid., 33). Through this principle "its polar principle of *tradition* has become itself enriched or fulfilled, namely become living or historical, subject to creative change as culture itself changes, and alive and relevant in each epoch" (ibid., 35).

[2]"Social history hardly reveals the intentions or the character of 'God'" (ibid., 33). "However, it does manifest that creative presence . . . [and] the divine judgments. . . . Every cultural vision . . . reflects an awareness of the divine presence giving power, order, and possibility to life. It is an aspect, therefore, of . . . the universal revelation or self-manifestation of God" (ibid.). Nevertheless, for Gilkey, ordinary experience is not the source of the substance of theology. If this were so nothing new or ultimately significant could be said to the world through the Christian message. The contents of faith are the major symbols (including those of Scripture) which interpret, illumine, and clarify human existence (ibid., 7-11, 13-14).

Ordinary experience has to do with what all communities have in common as human communities. Nevertheless, there seems to be revelation in ordinary experience in that revelation has to do with what makes a community different from others, namely their originating revelations.[1]

Second, the apprehension of originating revelation involves interpretation within the world.[2] This interpre-

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[1]Gilkey seems to identify a type of revelation through which the religious dimension, which remains hidden in the secular community of science, comes out into the open in religious communities (ibid., 40-41). Such communities view themselves as established by a divinely initiated event or originating revelation and sustained by a continuing divine presence. For Christians the final, unique, unsurpassable revelation is found in Christ (ibid.). "Christian revelation deepens and critically redefines in the light of its own vision of human existence in history the understanding of life characteristic of each culture" (ibid., 43). For Christians, each cultural vision is "a creative if dim foreshadowing of what is ultimately true and of value, an understanding of all things which through its positive creativity leads up to and points to a completion and fulfillment beyond itself. . . . On the other hand, each cultural vision represents a 'fallen' understanding, an ideological bias, and therefore a serious deviation from what is true and good" (ibid., 42).

[2]"When we speak of revelation through nature, through history, or through a sequence of historical events and a person, immediately implied is an interpretation and a mode, form, or tradition of interpretation. . . . Objective event and creative word, historical sequences and linguistic interpretation, unite in the manifestation of the divine" (ibid., 48). Revelation also includes "a polarity between the gift, on the the one hand, of a new level of being or life—the 'impersonal' base of our existence—and that—on the other, of a new *consciousness*, a new understanding, trust, and love—the 'personal' center of our existence" (ibid., 44).

tive apprehension is called dependent revelation.[1] Third, this means that Judeo-Christian Scripture is a dependent revelation.[2] Fourth, Gilkey's view of Scripture has been to a great extent affected by and is coherent with cosmological use of science and scientific "historical consciousness."[3]

In summary, influence of Natural Theology on the cosmological nature of Gilkey's model for the use of science is evident in and coherent with his views on the study of Scripture. This has been surveyed in terms of his view of hermeneutical levels of theology, relations of biblical and systematic theology, and of community and revelation. On the one hand, his model for the use of science is influenced by his Bibliology. This is because the originating

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[1]Distinction should be made between originating revelation, the event or events that begin a religious community and its tradition, and dependant revelation, the continuing process over extended time of the reception of that revelation by subsequent generations (ibid., 49).

[2]Therefore, Scripture is an instrument of revelation as it *re*-presents the originating event of Christ. Scripture is human--not divine, and a response to revelation. It is not itself revealed, and is thus historical and fallible. Therefore, there are no revealed truths, only truths about revelation. Protestantism has lost its infallible scripture and Catholicism its infallible church, though these remain means of Grace, witnesses to original revelation, and vehicles of dependent revelation (ibid., 51-53).

[3]Ibid., 52. "The Scriptures have come to be viewed as *human* documents reflecting the ideas, biases, hopes, and fears of their age and so filled with errors about nature, historical events, psychology . . . not to mention the less than perfect moral and social standards" (ibid.).

revelation of Christianity is preserved by the dependent revelation of Scripture. On the other hand, his Bibliology is influenced by his Natural Theology in that Scripture symbols are to be interpreted in terms of facts and meaning derived from scientific interpretation of common experience (category translation). With regard to facts, Scripture symbolism is revised in the light of science. However, science is not revised in the light of Scripture.

There is a degree of incoherence between Gilkey's discussions of the first step of Scripture interpretation which uncovers the eidetic meaning and the third step which requires translation of the meaning into categories informed by science. Gilkey refers to more than a translation of terminology. He refers to a discovery of what Scripture means in terms of what we can believe in light of science. Gilkey does not seem to be consistent in giving parity to analysis of our present science-influenced presuppositions and to what we learn from the Scripture. This is because scientific presuppositions arise from ordinary experience which is more fundamental than revelation, which makes communities distinct. Further, Scripture is not as fundamental as the revelation that distinguishes a community. Rather, it is a dependent revelation that mediates the originating revelation.

The next section investigates the coherence of Gilkey's cosmological model for the use of science in theology in terms of the influence of Christology on his model.

Christology

That Christology is an element in Gilkey's model for the use of science in theology is evident in his proposal that Christ is "the ultimate norm,"[1] "the center of Christian witness and understanding, of the Christian community's life, and thus of all Christian theology."[2] For Gilkey, Christ "represent[s] the definitive and decisive event of revelation in which God's power, will, and ultimate purposes are manifested in a unique way to human beings."[3] Each Christian symbol "receives its final certainty and its definitive shape only through this center."[4]

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[1]Ibid., 159.

[2]Ibid., 158. See James O. Yerkes, "'A Sharp Turn': Christology in a Time of Troubles," in *The Theology of Langdon B. Gilkey*, 363-400 (Macon, GA: Mercer University Press, 1999), 363-400.

[3]*Message and Existence,* 158. Christ is the "paradignatic expression" of the dialectical structure of Christianity: "affirmation, negation, and reaffirmation" of the world; and "the polarity of the sovereign preeminence and the self-giving of God combined with the dependence and yet the autonomy and initiative of human beings" (*Through the Tempest,* 101-102) "pointing to a union of both the divine and the human" (ibid., 112).

[4]*Message and Existence,* 158. "Thus, . . . truths about ultimate reality and about our existence are finally tested

Nevertheless, this section will show that Gilkey's model for the use of science in Christology is controlled by his Natural Theology and is therefore cosmological. First, as with his Natural Theology and Bibliology, Gilkey develops his Christology in correlation with ordinary experience as understood by science. Specifically, he presents Christ as the answer to the darker side of experience, the human predicament of sin[1] which is universal as well as personal.[2]

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and shaped in relation not, as reason might expect, to all persons, cultures, and events—'to general laws' discoverable in the widest experience; nor, as much religion might expect, in relation to our most compelling spiritual experiences. . . . Rather, it is one historical event, or series of events, that is taken to be the determinative or normative channel or medium through which both truth and grace, illumination and healing appear" (ibid., 159). The word *final* does not mean sole or exclusive. Rather, it indicates that it provides "the all-determining criterion and measure for the reality and nature of God, for what is in the end taken to be real, to be true and to be of value; that, therefore, on this basis the character of authentic human existence, individual and social, is to be determined; and that here the hopes—and fears—concerning our historical and transhistorical destiny are to be grounded" (ibid., 41-42).

[1]Ibid., 111-113. Finitude does not cause our predicament. It is "an aspect of the Christian awareness of ourselves in relation to God that we experience directly the goodness and possibility of our creaturely finitude" (ibid., 125).

[2]Ibid., 124. "This predicament appears in experience to be quite a universal *state*. Nearly inevitable, seemingly a *necessity* and a given like the human condition itself, almost as if we were tragically fated to it. . . . [However] we experience our own part in the human predicament . . . as personal, individual, and free, as something for which we are responsible and so blameworthy and, consequently,

Gilkey regards "most of the purported 'causes' of the human problem"[1] as "symptoms of the [real] problem, [which is] a wayward *self*, the self-interested, closed, prejudiced, ego-tripping self (or community of selves)."[2]

Second, for Gilkey, the influence of science on the content or substance[3] of the human predicament is more clear than in connection with any other doctrine. This is the case in spite of the fact that the form of Gilkey's description of the human predicament (to which Christ is the

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similar to an *action* which is not at all necessary and determined but willed and chosen" (ibid., 124; also 113).

[1]Ibid., 113. The problem is not due to certain kinds of groups of people or views; it cannot be the past only or our animal ancestry; it is not just psychological maladjustment or even our faulty social institutions. Nor is it a lack of knowledge, of hard or of clear thinking, of correct theory about ourselves and the world (ibid., 119-120).

[2]Ibid., 113.

[3]For Gilkey, "scientific developments [have] effected changes in the substance of theological doctrines as well as their forms" (*Nature, Reality, and the Sacred,* 21). His comments on the doctrines of creation and the fall illustrate this fact. "[First:] The symbols expressive of God's relation to the world and to us in the world, the symbols of creation and providence, remained; however, the ways these symbols were articulated and conceived—underwent a great transformation in the light of the new scientific understanding of the past. . . . 'Creation' is now understood as referring to a long, slow process of change" (ibid., 21). "[Second:] The Fall is presented as a symbolic narrative that discloses our undeniably universal but nevertheless puzzling alienation, or estrangement, from our divine ground, from our real selves, and from one another" (ibid., 23).

solution) is biblical.[1] The influence of science is evident in Gilkey's conclusion that "the story of a fall, is analogically, not literally a story."[2] It was "not an actual event in primal history."[3]

Third, for Gilkey, interpretation of the Christological solution must proceed in the same way as interpretation of the human predicament, that is, open to the influence of science. Thus, "we must start [Christology] with what historical sources we have, begin[ning] 'from below,' as in natural theology."[4] This is because the ultimate norm and center of Christianity is 'disturbingly vulnerable'. This was the case in the Hellenistic age which "abhorred history,

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[1]*Message and Existence,* 135; also 125-137.

[2]Ibid., 138.

[3]Ibid. However, Davis points out that, for Gilkey, theology rests not so much on God's maintenance of history as a whole, but on His intervention in a *particular* history. Gilkey minimizes the distinction between history and redemption by suggesting that redemption enters history. He avoids the Neoorthodox trap of divine action as personal encounter, and of inner-life/outer history dichotomy. History proceeds on the impetus of human intentionality (Davis, pp. v, 93, 99-100, 113; *Maker of Heaven and Earth,* 55, 283-286; *Reaping the Whirlwind,* 266).

[4]*Message and Existence,* 160. However, "historical inquiry, and the relative certainty it brings, is a necessary, but by no means the sufficient, basis for Christian confidence in or certainty about God's revelation in Jesus of Nazareth" (ibid., 160-161). Gilkey regards the "duality between the Jesus of history and the Christ of faith" as an "unsatisfactory" but "unavoidable distinction" (ibid., 161).

and thus was committed to a 'spiritual' interpretation of truth."[1] It is also the case in "the modern age . . . [that is] committed to an empirical interpretation of truth."[2]

Fourth, Gilkey's survey of results of scientific historical study leads to a very positive assessment of the biblical picture of the Christ of history and of faith.[3] However, the influence of presuppositions from science lead him to take an ambiguous position with respect to the interpretation of the biblical picture of the resurrection. On the one hand, because of its limits, science cannot confirm the traditional view of the resurrection of Christ.[4]

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[1]Ibid., 159.

[2]Ibid., 160. In the modern age, "concentration on one actual past event has . . . seemed unscientific, irrational, and infinitely precarious" (ibid.).

[3]As with his description of the human predicament (see point two above), Gilkey's description of Christ is to a great degree biblical in form. He describes as authentic the biblical record of "the time, place, and surroundings of his [Jesus'] life; the general contours and character of his proclamation and teachings; the typical mode or style of his life's pattern, his actions, and of his relations to others and to his social world; and his 'fate' at the hands of the Jewish and Roman authorities" (ibid., 162). This authentic history requires for its intelligibility a theological symbolization in the Christ of faith as the decisive event of divine revelation (ibid., 162-163). This is because the science of history, like other sciences, is confined in its method to finite, empirical, or secular explanations and causes. The divine may have a place but its presence cannot be *historically* or *scientifically* established without defying the methodology of science (ibid., 162).

[4]Ibid., 178-179. Gilkey seems to hold this position based on acceptance of the presuppositions of science and in

On the other hand, Gilkey makes an indirect use of scientific presuppositions to support his proposal that all theological language about the resurrection of Christ must be symbolic.[1] Clearly, his use of science influences the fact that his cosmological Christology negates as well as affirms and reinterprets traditional interpretations.[2] He argues that because of the developments of science,

> the classical interpretation of these symbols, the orthodox Christologies based on a divine person, completing a saving work and returning at the end

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spite of the historical evidence which he himself acknowledges. For example, he accepts that "it is historically undeniable that the new movement . . . based *its* new life and confidence on its certainty that God had raised Jesus from the dead. In turn, that belief was . . . founded on reports by innumerable disciples. . . . These reports, as they are recorded in the New Testament, are by no means legendary editions" (ibid., 179; also 163-178).

[1]Gilkey is traditional in his view of the resurrection as a work of God in history. Yet he is nontraditional in his view that since the resurrection was not a "natural" event, "in describing it, all language, even all apostolic language, is markedly symbolic. . . . It is, therefore, impossible for us to . . . explicate the mystery of this event in literal, spatial terms, as with the later [Scripture] stories of the empty tomb and of a bodily ascension to upper space" (ibid., 181).

[2]Ibid., 181-186. By acknowledging a factual element in religious language Gilkey maintains a traditional form for Christian theology. This is evident in his suggestion that theology rightly holds that "natural processes and historical events--particularly certain 'special' events--were in some significant regard relevant to, perhaps even crucial for, religious and theological language" (*Religion and the Scientific Future,* 19).

> of time, have in modern life especially, faced . . . seemingly insurmountable difficulties.[1]

In summary, the use of science in Gilkey's theology is influenced by his Christology. However, as with his Bibliology, his Christology is influenced by his Natural Theology. While the form of Gilkey's theology appears partly orthodox, he rejects elements of the orthodox view of Christ. This is based on the use of presuppositions of science in his Natural Theology.

An element of inconsistency arises in connection with Gilkey's Christology. On the one hand, he suggests that science agrees largely with the Scripture diagnosis of the condition of humanity and with the Scripture picture of Christ. On the other had, Gilkey rejects the Scripture description of the fall of humanity and the resurrection of Christ as actual events.

In the next section of this chapter, the coherence of the cosmological structure of Gilkey's model for the use of science will be further clarified. This will be accomplished by a survey of Gilkey's views on nature, Scripture, and Christ as sources and resources for theology.

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[1]*Message and Existence,* 186. Therefore, Gilkey uses the category of "event" to describe Christology in order to avoid a supernaturalist, and thus mythological, picture of Jesus and a humanistic, "religious hero" picture (ibid., 188).

Sources and Resources: Nature, Scripture, and Christ

The cosmological nature of Gilkey's model for the use of science in theology may be clarified by a description of his perspectives on nature, Scripture, and Christ as the sources and resources for theology.[1] This is because Gilkey regards theology as "an interrelation, [and] a correlation, of . . . different resources"[2] such as Christ, Scripture, and nature.

That Gilkey's Christology does not control his model for the use of science in theology is evident in that he does not identify Christ as being a separate source apart from Scripture. For him, in theology the "primary and normative source is Scripture as the central witness to the originating events of revelation."[3] In contrast, Christ is regarded as the primary symbol which is communicated through

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[1]According to David Haddorff, Gilkey reinterprets the resources of metaphysical structure and dogma that are interwoven with the objective data derived from the sources of Scripture and tradition. The source of theology is constant but resources change (Haddorff, 9, 89, 111-116).

[2]*Message and Existence,* 54. The structure of event, response, tradition, and autonomy shapes our view of the role and authority of the Scriptures, the Church, the role, authority, and procedures of theology, and Christianity (ibid., 51-52).

[3]Ibid., 54.

Scripture and which illuminates the originating events of revelation.[1]

Natural Theology controls Gilkey's Bibliology and Christology and his model for the use of science. This is evident in that, for him, nature is one of the resources for theology which provide "materials for the *re*interpretation or *re*-presentation of traditional symbols" as part of "the task of constructive or systematic theology."[2] These resources include "the 'situation' of the contemporary world" which is "formed largely by . . . science."[3]

According to Gilkey, the science-influenced correlation of nature, Scripture, and Christ as sources and resources does not involve unfaithfulness to Scripture. He writes:

> the theologian must reinterpret, re-present [religious symbols] in a manner intelligible to us [in an age of science] and yet "appropriate" or faithful to their sense in their original locus [eidetic meaning].[4]

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[1]Ibid. "The second if not the primary and normative resource is the tradition of the interpretation of Scripture, the tradition of theology" (ibid.).

[2]Ibid., 57.

[3]Ibid. Another resource is "latent within other religious traditions" (ibid., 61).

[4]Ibid., 56. "It is these symbols that are reinterpreted in different ways in tradition" (ibid.). The primary task of the theologian is to reinterpret classical symbols of the tradition in terms that are intelligible in our world and yet faithful to the original and continuing sense of that symbol in the tradition (ibid., 59).

As indicated in previous sections of this chapter, the issue of whether Gilkey has been consistent is debatable.

In summary, the influence of Natural Theology on the coherently cosmological nature of Gilkey's model for the use of science is evident in that:

1. Science influences his Natural Theology, which is a prolegomena to his positive theology. As a result, science interpenetrates his theology making his theism credible as well as nontraditional. There is a degree of incoherence in his separation of theology from matters of fact while calling for empirical theology.

2. The use of science in Gilkey's Bibliology is also cosmological in that it is controlled by his Natural Theology. Scripture symbols are interpreted in terms of facts and meaning derived from scientific study of common experience. Scripture symbolism is revised in the light of science; but science is not revised in light of Scripture. There is an incoherence here between an apparently high regard for the original meaning of Scripture and the reinterpretation of that meaning in light of science.

3. The use of science in Gilkey's Christology is also cosmological. As with his Bibliology, his Christology is influenced by his Natural Theology. While the form of his theology appears partly orthodox, he rejects elements of the

orthodox view of Christ. This is based on presuppositions of science. There is incoherence in, on the one hand, acknowledgment of the scientific support of the fallen nature of humanity and the historicity of Scripture records of Christ; and on the other hand, rejecting Scripture claims concerning the events of the fall and the resurrection.

4. Gilkey's discussion of the use of science in relation to the sources and resources of theology is cosmological in that it is controlled by Natural Theology. His model is not Christological in that Christ is not a separate source of theology but is the central normative symbol of Christian Scripture and tradition. On the one hand, his model appears biblical in that Scripture is the primary source to be correlated with other resources including science in such a way that theology must be faithful to science as well as to the original meaning of Scripture. On the other hand, his model is cosmological in that while it is faithful to the form of Scripture it is faithful to the substance and content of science.

The cosmological nature of Gilkey's model for the use of science in theology has now been surveyed. This has involved a general survey of his presuppositions about the nature of science and the nature of theology. In his cosmological empirical theology, Natural Theology is the

major influence on his model. His Bibliology and Christology are interpreted in coherence with his Natural Theology. In the next section, the dialectical nature of his model for the use of science in theology will be presented. This will involve a more detailed analysis of his model in terms of specific uses for scientific methods and scientific theories in theology.

A Dialectical/Correlational Model

In previous sections of this chapter it was demonstrated that Gilkey's model for the use of science in theology is not only responsive to postmodernism but is also cosmological. This section of this chapter addresses the question: What is the nature of Gilkey's model in terms of his proposal of specific uses of scientific theory and scientific method in theology? What is the extent of the use of science in his model?

Gilkey explicitly describes his model for theology as a "dialectical" or "correlational approach."[1] He accepts

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[1]*The Whirlwind in Culture,* 1-2. On dialectic correlation see his "The Dialectic of Christian Belief;" also *Gilkey on Tillich,* 61, 67, 71-73; *Message and Existence,* 10-11; *The Whirlwind in Culture,* 1-2. Gilkey regards Christianity itself as dialectical in structure (*Through the Tempest,* 101-102). He refers to his theology as dialecticl/correlational in an attempt to produce an empirical theology ("New Modes," 345). "My thought has reflected a 'correlational' approach. . . . Its course has been determined by the twists and turns of twentieth-century

Tillich's concept of "the interrelation, in fact the interdependence, of philosophy and religion, resulting in theology ([as] the method of correlation)."[1]

Gilkey's dialectical/correlational model for the use of science in theology is described here in terms of: (1) the basic nature of the dialectical/correlational use of science. Then the extent of the use of science will be described in terms of (2) dialectical/correlational uses of

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events. As the little volume [*Message and Existence*] summing up my theology indicates, this life work reflects a dialectic of message and existence" (*The Whirlwind in Culture,* 1). In this theology God's "ways are experienced, uncovered, and articulated in relation—and only in relation—first to the changing character of personal existence in our age, including of course my own, and secondly in relation to the shifting forms of social existence and the panorama of events that these personal existences inhabit" (ibid., 2).

[1]*Gilkey on Tillich,* 59. "The current situation in Western culture at the end of the century, even more than did his [Tillich's] own earlier situation (Germany during and after World War I, in the '20s and'30s) warrants the need for this sort of theoretical mediation between the cultural and the religious, for this theological dialectic of affirmation, negation, and reaffirmation" (ibid., 61). "In any case, since 1964 my reflective work . . . has been fundamentally Tillichean in form. This continuing dependence has been illustrated, first in *Naming the Whirlwind* (1969); then in the book *Religion and the Scientific Future* (1970); in the work on the philosophy of history, on providence, and the concept of God in *Reaping the Whirlwind* (1976); and perhaps more especially in *Message and Existence* (1979) and *Society and the Sacred* (1981) (ibid., xv).

scientific method, and (3) dialectical/correlatioal uses of scientific theory.[1]

The Basic Nature of the Model

Gilkey's dialectical/correlational model includes affirmation and negation of the use of science in theology. He refers to "paradoxical relation . . . [and] dialectic or tension . . . with our scientific knowledge."[2] He also writes about a "dialectical yes and no"[3] and "dialectical tensions[,] . . . paradoxes and polarities" between theology and science.[4] Therefore, his model seeks to resolve the

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[1]The distinction of method and theory is a matter of convenience and convention. "It is one of the main themes of the new philosophy of science that all knowing involves a preunderstanding, that all inquiry is theory-laden, and that therefore natural science is 'kin' to the discipline known as hermeneutics" (*Nature, Reality, and the Sacred,* 60). Gilkey does not critique scientific method or theory (ibid., 1-2).

[2]*Maker of Heaven and Earth,* 258-259. "Every doctrine of Christian faith expresses the paradoxical relation between the transcendent God and the world of facts. . . . Theological truth must maintain a dialectic or tension between God's transcendent eternity and the world of change and time, if it is to express the Christian gospel of God's salvation. . . . One of the basic problems of theology, then, is to express the relation of eternity to time as Christians understand it, without on the the one hand competing with our scientific knowledge of the origins of the natural universe of space and time, and without on the other losing all positive relation to the world of actual experience" (ibid.).

[3]*Through the Tempest,* 41.

[4]Ibid., 70. For Gilkey, this is "a fairly tricky balancing act. The academic name for such a saunter down a

tension of the limits and the extent of the use of science in theology. In his dialectical/correlational model, this may be viewed in terms of demonic and authentic correlation.

Demonic Correlation

For Gilkey, certain non-dialectic correlations or unions of science and theology are demonic. This is because they involve the improper use of science in theology. Such demonic correlations lead to an appearance of "warfare" between science and theology. This is really a warfare between competing religions. For example, there is the warfare of "liberal religion and liberal science" against "absolutist religion and its appropriate 'science.'"[1] Demonic warfare may also arise between the religious aspects of secular science and traditional religion as in the

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tight rope is *dialectic*: neither this, on the the one hand, nor that, on the other, but both-and, and only so much of this and only so much of that" (ibid., 168). He describes it as a "trapeze act" with an "important discontinuity," and an "important continuity" of God and ordinary experience. Dialectic also involves a "proceeding "from below" and "from above." This balancing theology must start with ordinary experience (*Message and Existence,* 10-11).

[1]*Creationism on Trial,* 121, 169. "The problem . . . is not that the forces of religion fight for dogma, ignorance, and dominance against the forces of scientific light—this is a nostalgic myth." "[I]t is two sets of religious symbolisms, both united to science, that are in conflict" (ibid., 121, 169).

conflict between scientism and creationism.[1]

According to Gilkey, in order to avoid demonic warfare between science and theology one should reject (1) use of scientific fact/evidence/truth as a base for theology,[2] (2) modeling theology as a science,[3] (3) overestimating the scope of science, and (4) use of science when it agrees with

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[1]According to Gilkey, "demonic" "intolerant, exclusivist, dogmatic, cruel, . . . infinitely destructive faith" can arise from "traditional religions *or* from the religious aspects of secular culture itself." "Scientific knowledge and religious belief may unite—and in a scientific culture, they will unite—in very dangerous ways" as when some religious and scientific groups supported the Third Reich (ibid., 121, 169). If science and religion are regarded as equivalent or as rivals, or if "theories of science are interwoven . . . with a materialistic, deterministic cosmology[,] . . . the teaching of science . . . is the teaching of atheism." This "'breeds creationism' as a reaction" (*Nature, Reality, and the Sacred,* 54-55).

[2]*Creationism on Trial,* 170-175. Exclusively "scientific" explanations are not tested hypotheses but *philosophical* and speculative conclusions. Just as early Christians regarded Christian truth as revealed and absolute philosophy, so contemporary literalism appears as a science based on facts and evidences. This results from a common error of our culture, that all relevant truth is factual, empirical, scientific truth with reference to secondary causes (ibid., 170-175).

[3]Gilkey describes as "bizarre" and "making no sense" the view that "biblical facts" and "religious truth" are "directly relevant to," or "of one piece with, scientific data" (*Religion and the Scientific Future,* 15). "Unless I [Gilkey] am way wide of the mark, for us religious knowledge . . . is not in direct continuity with scientific knowledge. We do not think it can function as part of a coordinated system of scientific or historical knowledge of the space-time system of things, even as its initiatory chapter, nor can it directly fill in any gaps there may be currently in that system" (ibid., 16).

theology while rejecting science when it contradicts theology.[1] Improper uses for science in theology may also be described in terms of scientific method and theory. Therefore, (5) "theological elements" are not to be sought "in the *conclusions* of science, or even in the implications of special scientific theories."[2] (6) Similarly, the method

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[1]For Gilkey, Creationists are on the increase. On the one hand, they regard theology as omnicompetent, extending into the domains of science. They deny that science is valid where it contradicts their own so-called knowledge. Creationism is religious realism like scientific realism, a positivism of revelation like the positivism of science. On the other hand, Creation scientists and many of their scientific opponents overestimate the scope of science by regarding results of scientific method as the sole elements of reality (*Nature, Reality, and the Sacred,* 11-14, 49).

[2]*Religion and the Scientific Future,* 40. Gilkey claims not to base doctrines on the implications of scientific theories; or to regard scientific inquiry as a useful mode for establishing religious beliefs; or to define theology as translation of scientific theories into analogous religious notions (ibid., 38). However, Kane ("God-Language and Secular Experience") and Ferré ("A Renewal of God Language?") contend that Gilkey confines theology to the secular mood of science. For Kane, Gilkey's approach is irrelevant to the traditional ultimate questions which still trouble many thoughtful people. Ferré suggests that Gilkey is selling a perspective which is categorically rejected by the secular mood. Shea responds that Gilkey does not uncritically accept the secular mood of science as normative but attempts apologetics in light of this mood. Gilkey is aware that relevance does not determine truth and truth does not always imply relevance. Further, the present situation does not involve a "secularist vs. Christian" battle. Even in the Church the secular mood prevails and the meaning of God is questioned. Gilkey responds not to cynical indifference but to an openness to discovering the meaning of Christian symbols (Shea, 177-180).

of theology should not follow the method of science.[1]

Dialectical Correlation

In spite of the discussion of demonic use of science, for Gilkey, there is an authentic model for the use of science. He proposes to "look in the activity of scientific inquiry itself . . . [for] elements of ultimacy or of the unconditioned."[2] He also proposes that "religious language and its symbols have one of their secular foundations in the tacit experience of ultimacy revealed in . . . the theoretical structure . . . of science itself."[3]

Gilkey proposes authentic dialectical correlation of science and theology in terms of dialectical correlation with the human situation and experience. Such a model includes "correlatively . . . interpreting the human

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[1]Langdon B. Gilkey, "Empirical Science and Theological Knowing," in *Foundations of Theology, Papers from the International Lonergan Congress*, ed. Philip McShane, S.J. (Dublin, Ireland: Gill and MacMillan, 1971), 76-77; Clifford, 73-126. Lonergan refers to an empirical method which includes the data of sense and of consciousness (Bernard Lonergan, "Second Lecture: Religious Knowledge," in *A Third Collection, Papers by Bernard Lonergan, S.J.*, ed. Frederick E. Crowe, S.J. [New York: Paulist Press, 1985], 141).

[2]*Religion and the Scientific Future,* 40.

[3]Ibid., 62.

situation"[1] which is "formed largely by . . . science";[2] and "includes, therefore, the natural and human sciences."[3] This model also includes "correlation with ordinary experience"[4] through "an interrelation"[5] "with all other modes of inquiry" including science.[6] Gilkey views science as the most important factor in the current interpretation of experience and the transformation of theology.[7]

In the next section Gilkey's dialectical/correlational model for the use of science will be described in terms of specific uses of scientific method and theory.[8] He writes:

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[1]*Message and Existence,* 53.

[2]Ibid., 57.

[3]Ibid., 58. Gilkey here refers to the human situation as the "modern 'situation'" (ibid.).

[4]Ibid., 9. Theology involves "an essential interrelation between human experience and divine revelation" (ibid., 13). Ordinary human experience includes the "'existential' level" and the "intellectual-reflective" level which "are interacting and interrelated all the time" (*Maker of Heaven and Earth,* 14).

[5]*Message and Existence,* 54.

[6]Ibid., 16, 57-58. See discussion of resources with which theology is correlated: Scripture, Christian tradition, the human situation, and other traditions (ibid., 54-64). "As reflection . . . theology establishes relations, and must do so, with all other modes of inquiry" (ibid., 16).

[7]*Society and the Sacred,* 76-77; *Religion and the Scientific Future,* 4.

[8]Gilkey does not list all the uses of science in one place. The list presented in the next section of this

> We must, I believe, enter into the inmost sanctum of this secular culture, namely its justified confidence in scientific inquiry [method] and its optimism about the application of scientific knowledge [theory] to man's problems, and find *there* the grounds and uses of religious discourse.[1]

Dialectical/Correlational Use of Scientific Method

The dialectical model proposed by Gilkey includes the use of methods and theories of science in relation to "the grounds and the uses of religious discourse."[2] Gilkey makes at least nine proposals for the use of scientific method.

First, in connection with the ground of religious discourse, there is a dialectical use of scientific method (a) as part of the ground of religious discourse; (b) as part of the object studied by theology;[3] (c) to show the

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chapter is gleaned from extensive reading of Gilkey but does not claim to be exhaustive.

[1]Ibid., 37.

[2]Ibid., 37.

[3]Gilkey aims "to show how [religious discourse] . . . has a ground in the most 'secular' of our pursuits, namely scientific inquiry itself" (ibid., 36). This conclusion is based on the fact that science involves presuppositions of "religious ultimacy," "faith affirmation," and "commitment" (*Nature, Reality, and the Sacred,* 38, 51) which are to be clarified by theology (*Religion and the Scientific Future,* 63-64, 76). Ronnie Littlejohn comments that Gilkey's model contains similar presuppositions and fails in its attempt to distinguish phenomenology and fact, or religious and general experience. It is limited to transcendental import, and depends on intuition rather than argument (Littlejohn, "Analysis of Langdon Gilkey's Phenonenology of Ultimacy and

relevance and necessity of religious discourse;[1] (d) to contribute to theological intelligibility,[2] and (e) to facilitate the unification of science and theology.[3]

Second, in connection with the uses of religious and theological discourse, Gilkey proposes a dialectical use of scientific method (a) to demonstrate the mythical, symbolic and nonfactual meaning of religious discourse;[4] (b) to evaluate the factual and the historical aspects of religious and theological language;[5] (c) to teach theology to be open ended or provisional in its response to revelation,[6] and (d)

Its Implications for Theology and Ethics."

[1]For Gilkey, "inevitably one is led [by scientific method] to mythical or religious discourse" and "a deepening of the mythical consciousness" (*Religion and the Scientific Future*, 63, 66, 125). "The vast new powers of science do not, in the end, make religious faith and commitment irrelevant; they make them more necessary than ever" (ibid., 98).

[2]*Nature, Reality, and the Sacred*, 75.

[3]"An intelligent and self-consistent science points beyond itself to . . . the necessary theoretical point of unity between the cognitive disciplines" (ibid., 74). The problems of the relations of scientific theory/knowledge and theology/religious disclosure seem resolved in principle since the demise of logical positivism and scientific empiricism and the birth of the new philosophy of science and the new relevance of the science of *hermeneutics* which is suitable to religious understanding (ibid., 44).

[4]For Gilkey, contemporary philosophy of science has concluded that "all our knowledge is symbolic" (ibid., 39).

[5]*Religion and the Scientific Future*, 4.

[6]Theology involves error, relativity,

to teach theology that cognition takes place at different interpenetrating levels.[1]

The uses of science proposed by Gilkey involve a paradox. On the one hand, science has influenced a change from

> understanding of religious truths as made up of propositions containing, among other things, divinely revealed 'information' on almost any topic of interest, to the understanding of them as a system of symbols.[2]

Thus, "science has successfully eradicated" this "*factual* element" "once and for all, for good or for ill."[3]

On the other hand, there is "an inescapable 'factual' or 'matter-of-fact' element in all early myth."[4] The religious dimension is "revealed" in "special historical

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misinterpretation, and distortion. The whole tradition reflects only part of the truth. The Holy Spirit in the Christian community and in world progressively completes and refashions what is biased in every formulation (*Message and Existence,* 17-18, 33).

[1]*Nature, Reality, and the Sacred,* 40. "Involved with all of these levels as intrinsic to their possibility are our intuitions of reality as a whole and of the sacred" (ibid., 40).

[2]*Religion and the Scientific Future,* 4.

[3]Ibid., 6; see *Maker of Heaven and Earth,* 284; *Catholicism Confronts Modernity,* 96-97.

[4]*Religion and the Scientific Future,* 5.

events" which, according to "Bible witnesses," "could be observed . . . within material nature and within history.[1]

Dialectical/Correlational Use of Scientific Theory

The dialectical model proposed by Gilkey also includes at least eleven uses of scientific theory in theology.[2] These may be organized in two categories based on whether or not they parallel the uses of scientific method mentioned above.

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[1]*Maker of Heaven and Earth,* 132. For Davis, Gilkey holds some doctrines as less mythical than others. For example, the incarnation is historical but creation is not (Davis, pp. v, 93, 99-100, 113; *Maker of Heaven and Earth,* 55, 283-286; *Reaping the Whirlwind,* 266). See also Gilkey's review of *A Christian Natural Theology* by John B. Cobb, Jr., in *Theology Today* 22 (1996): 531-534; "Biblical Symbols in a Scientific Culture," in *Science and Human Values in the Twenty-first Century,* ed. Ralph Wendell Burhoe (Philadelphia: Westminster Press, 1971); "Modern Myth-Making and the Possibilities of Twentieth-Century Theology," in *Renewal of Religious Thought, Proceedings of the Congress on the Theology of Renewal of the Church Centenary of Canada, 1867-1967,* ed. L. K. Shook (New York: Herder and Herder, 1968); *Catholicism Confronts Modernity,* 86-97; "Cosmology," 194-196, 205; *Naming the Whirlwind,* 92, 237, 465; *Reaping the Whirlwind,* 43-44, 145, 247, 266, 311-312; *Maker of Heaven and Earth,* 293; "Symbols, Meaning, and the Divine Presence," 256.

[2]Sometimes Gilkey seems to emphasize the use of scientific theory more than the use of scientific method. For example: "Apparently, then, what finally caused the change in religious language we are tracing was not so much the method of modern science as a shift in the direction and character of its interests" (*Religion and the Scientific Future,* 8).

First, as with scientific method, scientific theory is used dialectically to clarify the ground and uses of religious discourse[1] by (a) influencing the shift away from the understanding of religious truth in terms of matters of historical fact;[2] (b) evaluating the accuracy of apparently factual elements in theological language;[3] and (c) constituting, as theory about fact, part of the object of theology.[4]

Second, in connection with the uses of religious discourse, scientific theory is used dialectically (a) to

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[1]Ibid., 37. "Religious language and its symbols have one of their secular foundations in the tacit experience of ultimacy revealed in the passions, the theoretical structure, and the rational judgments of science itself" (ibid., 62).

[2]Ibid., 18. Gilkey comments: A "new cluster of sciences became dominant, namely geology, paleontology, and biology . . . [, which] were historical. . . . [These] new sciences showed that the Biblical history was in error . . . and the understanding of what Biblical truth was had perforce to change" (ibid., 8-9; see also 9-22, 122).

[3]Ibid., 19; also *Catholicism Confronts Modernity,* 98; Davis, 90. "In faith and theology the fact, while remaining fact, is understood mythically" (*Maker of Heaven and Earth,* 283). This is because "the divine dimension and meaning of the fact, [which is] the activity of God within it, is described analogically and paradoxically" (ibid.). As a result, the divine dimension and significance of these events which is "their special relation to God's activity of revelation and salvation, is known only to faith" (ibid., 133).

[4]Gilkey perceives an element of ultimacy in the role of theories within science which makes these theories an object for theological study. On relations between facts and ultimacy see *Maker of Heaven and Earth,* 258-259.

separate religious language into two elements: "its transcending aspects pointing to ultimacy and sacrality, to the actions of God, and its factual aspects";[1] (b) to explain the primal symbols of religion in terms of correlation/relation with the meaning/knowledge theology finds in science (and philosophy);[2] (c) to transform the content and

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[1]*Religion and the Scientific Future,* 19. For Gilkey, "it was the claim of science, a claim accepted by all liberals, exclusively on its own terms to provide explanatory knowledge of spatiotemporal matters of fact, that effected this separation. . . . And thus did theological statements about God and his activities become what we now call 'sheer myth' or 'broken myth,' symbol qua symbol" (ibid.).

[2]*Nature Reality, and the Sacred,* 32-33, 76. One should not conclude that, since myth is not good science it must be discarded and replaced by scientific hypotheses (*Maker of Heaven and Earth,* 24). On the one hand: "If it is true . . . that it [theology] is concerned with what science is about, then surely it should be dispensed with when it fails to meet the test of scientific method. But if it is concerned with an entirely different subject matter, then science can have no valid objection" (ibid., 24-25). On the other hand, "to be intelligible to us and thus adequate for our inner assent, religious symbols must make reflective contact with . . . the world. . . . Hence religious symbols . . . must be filled out by, correlated with, and related to the 'knowledge' gained, first in ordinary personal and social experience and, second (for theological reflection), in the historical, the physical, and the social sciences" (*Nature, Reality, and the Sacred,* 32-33). For David Haddorff, Gilkey correlates existential questions with answers from revelation, and secular spirit (modern historical consciousness) with a reinterpretation of providence. Speculative philosophy, metaphysics, and science are united in his phenomenological analysis of experience in its positive-negative dialectic (Haddorff, 9, 89, 111-116).

substance of religious symbols;[1] (d) to provide scientific-limit questions or puzzles demanding a spiritual symbolic system which may be provided by theology;[2] (e) to clarify the structure of religious event and response, tradition and autonomy and (f) the theological role and authority of Scripture, Church, theology, and Christianity;[3] (g) to contribute to explanation and understanding of theory in theology,[4] and (h) to the validation of theological theory.[5]

In summary, this section has surveyed Gilkey's

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[1]*Nature, Reality, and the Sacred,* 21.

[2]The classic answer to the limit question of viability was technology, but now we see that technology must be slowed or stopped, lest it destroy us. Irrationality threatens nature, on which rationality depends, and science is destructive, submerging the sacred. Rescuing nature and humanity has become a religious issue which responds to the dialectic of life and death, being and nonbeing, which renews life and the environment (ibid., 79-169, 163).

[3]*Message and Existence,* 50-53.

[4]*Nature, Reality, and the Sacred,* 41.

[5]"New Modes," 368-369. There are three criteria or modes of validation of theology: (1) it reflects the meaning of symbols as they have functioned in the life of a community; (2) it illuminates the existential ultimate questions of life, and provides useful models and direction for decisions and ground for hope; (3) it is able to elaborate its symbols into intellectual categories (*ibid.*). An important criterion is subjective. "Without an existential reception of the hierophany, an apprehension of the sacred in and through symbols, there is no multivalence, no religious use of language, no positive or assertive *religious* speech at all, and so neither a valid use of symbols nor any relevance to ordinary experience" (ibid., 369).

dialectical/correlational model for the use of science in theology in terms of demonic and authentic uses. Demonic use of scientific method and theory should be avoided. Gilkey describes authentic use of science in theology in terms of the ground and use of religious discourse. In this connection, he makes at least twenty proposals for the dialectical/correlational use of scientific method and theory in theology.

In one sense, Gilkey seems open to the charge that he does not follow his own advice. Is there not possibly a sense in which (contrary to his own advice) he bases his theology on science and overestimates the scope of science? Does he not do this when he seeks for theological elements in the conclusions of science and their implications?

The next section of this chapter summarizes the evidence presented above concerning the postmodern, cosmological, and correlational nature of Gilkey's model for the use of science in theology.

Summary

This chapter has covered a lot of ground. The first section introduced Langdon B. Gilkey and his model for the use of science in theology. Gilkey is a prolific and outstanding theologian who has proposed a model for the use of science in theology. The importance of his model is

indicated by his many professional accomplishments and by the favorable assessments given by his theologian peers.

The second section of this chapter addressed the issue of Gilkey's responsiveness to the postmodern shift in science and in its use in theology. While he does not identify himself as postmodern, Gilkey's contemporary relevance is evident in his discussion of historical shifts in science and its use in theology, and of persons and issues related to these shifts. He discusses the "new" modern (or postmodern) science, and the use of science in liberal, neoorthodox, and postneoorthodox models. He perceives positive elements as well as significant flaws in each of these models for the use of science in theology. Clearly, Gilkey is responsive to the postmodern shift.

In the third section of this chapter, the cosmological nature of Gilkey's model for the use of science in theology was presented in terms of his view of science and his view of theology. First, Gilkey has a high view of science as providing real, normative, singular, and reliable knowledge. It is the most important cultural influence on theology and is an avenue for experience of God. However, Gilkey also points out the limits of science. Science and theology are mutually interdependent since the foundations of science include presuppositions, myth, and faith; and science,

unlike theology, cannot deal with the universe as a whole.

Second, Gilkey proposes an empirical theology which includes Natural Theology, Bibliology, and Christology. His model for the use of science in theology is cosmological.

1. He uses science in his Natural Theology as a Theological Prolegomena to Positive Theology. This makes theism and faith credible and nontraditional. The use of science involves interrelation, interpenetration, and distinction without dichotomy between science and theology.

2. The cosmological use of science is also evident in Gilkey's Bibliology. On the one hand, Gilkey's model is influenced by his Bibliology. On the other hand, his Bibliology is controlled by the use of science in Natural Theology in that Scripture symbols are interpreted and revised in response to facts/meaning derived from scientific interpretation.

3. Gilkey's model for the use of science is influenced in part by his Christology. However, his Christology is more influenced by the use of science in Natural Theology. Therefore, while the form of Gilkey's theology is partly orthodox, he rejects elements of the orthodox view of Christ. This is based on the use of science in theology.

A fourth section of this chapter presented the dialectical/correlational nature of Gilkey's model in terms

of the non-use and use of science in theology and in terms of demonic and authentic use of science. Authentic dialectical use of science involves an interrelation and tension between science and theology based on the interrelation and tension between theology and philosophy. It also involves a correlation with the secular experience of ultimacy as informed by science. As a result there is a limited use of science in theology in terms of specific uses of scientific theory and method in theology.

Dialectical/correlational use of scientific method and theory may ground, explain, transform, influence, and separate elements of religious discourse. Other uses of science have to do with the object, relevance, necessity, mythical/symbolic nature, historicity, meaning, content, autonomy, cognition, tradition, problems/questions, and theoretical structure of religious discourse and its unification with science.

Conclusion

In general terms Gilkey has provided a very coherent model for the use of science in theology. Responsiveness to the postmodern shift has facilitated his deconstruction of traditional views of Natural Theology, Bibliology, and Christology. The cosmological nature of his theology in turn supports a comprehensive model for the use of science

in theology. This is evident in the wide range of proposed dialectical/correlational uses for science in theology.

However, there seem to be elements of incoherence in Gilkey's model. First, he holds that science is (a) our only way of cognitive relation to nature, (b) the normative mode for knowledge of nature, and (c) a way to experience God and God's truth. However, he also holds that theology provides real knowledge and (unlike science) can deal with nature as a whole. Thus science and theology are interdependent. The apparent incoherence is countered by the proposal that theology provides real but non-cognitive knowledge.

Second, on the one hand, for Gilkey, theology is empirical because its object, like science, is common experience. On the other hand, he holds that theology does not deal with matters of fact. What Gilkey seems to mean is that theology does not establish what is fact. However, he also gives to science a dominance over theology with regard to the trans-scientific interpretation of facts. Here the apparent incoherence has to do with an empirical theology which yields so much to science with regard to facts.

Third, there seems to be incoherence between Gilkey's first eidetic step of Scripture interpretation and his third step, which translates the meaning of Scripture into another

meaning in light of science. Gilkey does not seem to be consistent in giving the parity he proposes, on the one hand, to analysis of our present science-influenced presuppositions and, on the other hand, to what we learn from the Scripture. This is because of his view of Scripture as dependent revelation.

On the one hand, his model appears biblical in that Scripture is the primary source to be correlated with other resources including science in such a way that theology must be faithful to science as well as to the original meaning of Scripture. On the other hand, while his model is faithful to the form of Scripture, it is, more importantly, faithful to the substance and content of science.

Fourth, Gilkey separates theology from matters of fact while calling for an empirical theology. On the one hand, he acknowledges scientific support of the biblical view of the fallen nature of humanity and the history of Christ. On the other hand, based on scientific presuppositions, he rejects certain Scripture claims concerning the events of the fall and the resurrection.

Fifth, Gilkey seems open to the charge that he does not follow his own advice. Is there not a sense in which he bases his theology on science and overestimates the scope of science? Does he not seek theological elements in the

conclusions and implications of science?

Chapter 4 compares and contrasts Torrance's and Gilkey's models for the use of science in theology.

CHAPTER IV

TORRANCE'S AND GILKEY'S MODELS: COMPARISON AND CONTRAST FOR COMPLEMENTARITY

Introduction

Thomas F. Torrance's and Langdon B. Gilkey's models for the use of science in theology were surveyed in chapters 2-3 of this dissertation. In this fourth chapter their models are evaluated by comparison and contrast for complementarity. In other words, their models will be further investigated in order to discover which elements of their models are similar (comparison) and which elements are different (contrast). In addition, these similarities and differences are evaluated as to whether they may be combined within a more comprehensive model (complementarity). Sue Patterson refers to such a model as "a hybridizing master model."[1] More specifically, this chapter will explore

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[1]Sue Patterson writes that complementarities and conflicts indicate the need for synthetic understanding to combine insights from various models without departing from what is the core of Christian belief. Some theologians from opposing schools have moved closer to each other in their awareness of the need to address Christian truth claims in the face of the complex nature of worldly existence. If these theologies are all true in part (and false in part),

whether elements from Torrance's and Gilkey's models may be combined within a model for the use of science (1) in Natural Theology within Theological Prolegomena as well as (2) in Natural Theology within Positive Theology. This exploration is not a recommendation of such a hybrid model. Rather it is a description and evaluation of such a model. An alternative model will be recommended in the final chapter of this dissertation.

As with previous chapters, this chapter 4 is divided into sections on (1) biographies and introduction of models, (2) responsiveness to the postmodern shift in science and theology, (3) roles for Christ, Scripture, and nature, and (4) roles for dialogical and dialectical uses of scientific method and theory.[1] In pursuing these matters, this chapter

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it may be that their models are at fault or that their frameworks are too limited, rather than that their insights are off-track. What is required is *a hybridizing master model* that is able to account for all the key insights and resolve some of the conflicts (Sue Patterson, *Realist Christian Theology in a Postmodern Age* [Cambridge, UK: Cambridge University Press, 1999], 5).

[1]A way beyond dialogical and dialectical models is suggested in K. Helmut Reich's view that complementarity thinking "falls between analogical and dialectical thinking and involves features of both" ("The Relation Between Science and Theology: The Case for Complementarity Revisited," *Zygon* 25, no. 4 [1990]: 371). On the one hand, Torrance's dialogical model may also be described as analogical in that he identifies analogy between science and theology (*Theological Science,* 183-184; Klinefelter, 127). On the other hand, like any other branch of science, theology has unique features (*Theological Science,* 25). For

compares and contrasts recurring issues. As a result, some repetition of material and expression is inevitable.

This section of this chapter compares and contrasts the biographies of Torrance and Gilkey, and their introduction of models for the use of science in theology. This provides a backdrop for the issue of which elements of these models may be combined within a more comprehensive model.

Who Are Torrance and Gilkey?[1]

As is inevitable with any two theologians, there are many contrasts between Torrance and Gilkey. Torrance was born to missionary parents in China, while Gilkey was born to liberal Protestants in Chicago. Torrance pursued his professional life in Europe, whereas Gilkey pursued his career in America. Torrance studied under Barth, while

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Reich, "thinking in terms of complementarity seems to be a necessary condition for reaching the higher stages of religious development" (385). Nevertheless, there are significant limits to Reich's model. See his "The Chalcedonian Definition: An Example of the Difficulties and the Usefulness of Thinking in Terms of Complementarity?" *Journal of Psychology and Theology* 18, no. 2 (1990): 148-157; Kevin J. Sharpe, "Relating Science and Theology with Complementarity: A Caution," *Zygon* 26, no. 2 (1991): 309-315; Hugo Adam Bedau, "Complementarity and the Relation between Science and Religion," *Zygon* 9, no. 3 (1974): 202-224; Christopher Kaiser, "Christology and Complementarity," *Religious Studies* 12 (1976): 37-48; D. M. MacKay, "Complementarity in Scientific and Theological Thinking," *Zygon* 9, no. 3 (1974): 225-244.

[1]See sections on Introduction in chapters 2 and 3.

Gilkey studied under Tillich. Torrance served as an army chaplain in World War II and Gilkey was interned by the Japanese during the same war. Torrance began his teaching career with the teaching of Church history, while Gilkey began with the teaching of philosophy. Torrance is known for his service as Church administrator--Gilkey is not. Finally, Torrance's model for the use of science in theology is more Barthian, while Gilkey's model is more Tillichian.

There are also intriguing comparisons between Torrance and Gilkey. They were both born in the first decade of the twentieth century (1913 and 1919 respectively) and have had outstanding teaching and writing careers which facilitate the study of their mature positions. Both are prolific Protestant theologians who have received numerous awards and glowing assessments from their peers concerning their contribution to the issue of the use of science in theology. Both have been significantly influenced by the neoorthodox movement; Torrance more through Barth, Gilkey more through Tillich.[1] Coincidentally they published books on Barth and Tillich respectively during the same year, 1990.

The comparison and contrast between the biographies of Torrance and Gilkey provide an interesting backdrop to the comparison and contrast of their introductions to their

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[1]On Tillich's ambiguous relation to neoorthodoxy see section on The Postmodern Period in chapter 1.

models for the use of science in theology.

How Do They Introduce Their Models?[1]

There is both comparison and contrast in the way in which Torrance and Gilkey introduce their models for the use of science in theology. For example, there are contrasts in the details which they include in their surveys of the history of science and its use in theology. However, the comparable responsiveness to postmodernity of both models is implied in the nature of both their surveys of the premodern, modern, and postmodern periods.[2]

In addition, Torrance and Gilkey are comparable in that they work within the Judeo-Christian tradition. Thus their models for the use of science in theology are described in terms of the influence of divine revelations in Christ, in Scripture, and in nature. However, there are elements of obvious contrast.[3] Torrance explicitly introduces his model as Christological and dialogical while Gilkey's model is implicitly cosmological and explicitly dialectical.[4]

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[1]See sections on Introduction in chapters 2 and 3.

[2]See the next section below.

[3]See section on Significance of Torrance's and Gilkey's Models in chapter 1.

[4]See sections on Christological and cosmological models in chapters 2 and 3. Tension between the models of Torrance and Gilkey is evident, first, in Gilkey's seeming to suggest

It is to be expected that there will be incompatible elements in models produced by different theologians who function within different post-neoorthodox theological traditions. However, in subsequent sections of this chapter exploration will be done to show whether similar and dissimilar elements from Torrance's and Gilkey's models may be complementary when combined within a more comprehensive model.

Responsiveness to the Postmodern Shift

Torrance and Gilkey do not describe their models as postmodern. However, the responsiveness of their models to the postmodern shift may be compared and contrasted for complementarity. This involves a study of their views on the history of science and its use in theology.[1]

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that elements of Torrance's model are demonic, such as the definition of theology as a science (Gilkey, *Creationism on Trial,* 121, 169-175; idem, *Nature, Reality, and the Sacred,* 54-55). Second, Torrance seeks to distinguish his own theology from Gilkey's kind of dialectical theology (Torrance, *Theological Science,* 7, 17, 42, 125-161, 307; idem, *Christian Theology and Scientific Culture,* 117-119). However, for Morrison, Carl Henry correctly criticizes's Torrance's dialectical theology (Morrison, "Thomas Forsyth Torrance's Critique," 53-54, 61-63).

[1]See sections on Responsiveness to the Postmodern Shift in chapters 2 and 3.

The History of Science[1]

Comparison and Contrast

Torrance's and Gilkey's discussion of the history of science may be compared and contrasted. First, they present similar discussions of four periods and three shifts in science. Torrance describes the history of science in terms of shifts in cosmology, while Gilkey describes shifts in perspectives on knowledge. Gilkey refers to shifts from ancient to medieval, to "classical modern," to "new modern" perspectives. Torrance refers to shifts from primitive Greek, to Ptolemaic, to Copernican/Newtonian, to Einsteinian cosmologies. Both theologians regard the latest shift as radical and still in process. Torrance refers to the radical nature of the third shift as a "new" Copernican revolution. Gilkey refers to an obsolete modern science, and a new model of science. Both theologians regard relativity and quantum theory as marking the presently incomplete shift to the new science.

Second, while Torrance and Gilkey do not refer to themselves as postmodern, they do refer to scientists, philosophers, and theologians who may be categorized as postmodern. On the one hand, they attribute their greatest

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[1]See sections in chapters 1-3 on The History of Science and The History of Its Use in Theology.

inspiration to Barth and Tillich respectively, who represent two late-modern or postmodern trends developing from the neoorthodox movement's reaction to modern science and theology.[1] On the other hand, Torrance and Gilkey may be compared in that both favorably mention some of the same postmodern thinkers such as Kuhn[2] and Polanyi.[3]

Third, Torrance and Gilkey are contrasted in that they propose different issues as the key issue in the recent shift in science (referred to in this dissertation as a postmodern shift). On the one hand, Torrance describes this new modern science in terms of new conceptions of objectivity and subjectivity, and the shift from dualistic to unitary thinking. On the other hand, Gilkey refers to

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[1]See section in chapter 1 on Models of Science and Theology.

[2]Thomas Kuhn, *The Structure of Scientific Revolutions;* idem, "On the Relationship of Theology to Science," in *Religion and The Natural Sciences,* 57-60.

[3]See Michael Polanyi, "Faith and Reason," *Journal of Religion* 41 (1961): 237-247; idem, *Personal Knowledge* (Chicago: University of Chicago Press, 1958); idem, *Science, Faith and Society* (London: Oxford University Press, 1946). See also Thomas F. Torrance, "The Place of Michael Polanyi in the Modern Philosophy of Science," *Ethics in Science and Medicine* 7 (1980): 57-95; idem, ed., *Belief in Science and in Christian Life: The Relevance of Michael Polanyi's Thought for Christian Faith and Life* (Edinburgh: Handsel Press, 1980). Torrance is also the editor of Alexander Thompson's, *Tradition and Authority in Science and Theology With Reference to the Thought of Michael Polanyi* (Edinburgh: Scottish Academic Press, 1987).

outdated presuppositions of science and scientific ambiguity concerning myth.[1] However, Torrance and Gilkey may be both compared and contrasted in that each deals with the key issues raised by the other, albeit in different ways.

Like Torrance, Gilkey refers to the overcoming the dichotomy of objectivity and subjectivity within science through participation.[2] However, Gilkey ambiguously refers to overcoming the objectivity-subjectivity dichotomy *within science* while arguing that science points *beyond science* to the unity of objectivity and subjectivity.[3] This may be in part a result of Gilkey's relative lack of emphasis on what Torrance refers to as the overcoming of dualism in the philosophy of science.

In addition, like Gilkey, Torrance acknowledges the obsolescence of certain scientific presuppositions. He also accepts the symbolic nature of scientific language. Yet there is a contrast between Torrance and Gilkey with regard

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[1]See sections in chapter 3 on Four Outdated Propositions and Modern Science and Myth.

[2]Patterson explains: "We indwell that which we perceive and in so doing are absorbed into and participate in its reality. Knowledge and reality, therefore are personal, but in a way that turns the tables on subjectivity in that the subject becomes recipient and channel of a transcendent rationality" (Patterson, 14; Torrance, *Reality and Scientific Theology*, 27).

[3]Gilkey, *Nature, Reality, and the Sacred,* 74.

to symbolic language. Gilkey, again ambiguously, refers to symbolic scientific language as symbolic or mythical while regarding myth as trans-scientific. Hence he regards myth as legitimate. In contrast, Torrance regards myth as pre-scientific and illegitimate.[1] He also refers to a historical transition from myth to science.[2]

Complementarity

Torrance's and Gilkey's descriptions of the history of science present complementary surveys in terms of (1) the premodern, modern, and postmodern shifts/periods, and (2) scientific objectivity, subjectivity, dualism, unitary

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[1]See section on Overcoming Dualism in chapter 2.

[2]Torrance, *Ground and Grammar,* 117. This is a "transition from *mythos* to *logos*" (ibid.). Similarly, Torrance refers to a transition "from *mythologia* to *theologia*, from mythology to theology" (ibid.). This is a "transition from prescientific thinking to genuine scientific thinking, from image to inner logic, from subjectivity to objectivity, from symbolically interpreted appearances to intrinsic intelligibility" (ibid.).

For Torrance, mythical theology is avoided when "empirical and theoretical factors are held in inseparable unity" (ibid.). As a result, "scientific thinking and understanding moves to that deeper level, refusing to rest content with the surface patterns of observational experience" (ibid., 120). "We operate with an inherence of form in being" (ibid., 121). "Far from being a picturing model then, a disclosure model of Christ is one in which, not the representative, but the referential element is primary, for it functions only as an instrument for the progressive self-revelation of Christ to us" (ibid., 126). "As a disclosure model it calls for further and further refinement in the light of the deepening knowledge of Christ reached through it" (ibid., 127).

thinking, presuppositions, and symbolic/mythical language. Their similar responsiveness to the postmodern shift gives hope that there may be elements of complementary within their different models for the use of science in theology. However, the nature of that complementarity is complex,[1] as will be described in subsequent sections of this chapter.

Nevertheless, the issue of the relations between symbol and myth in scientific perspective deserves special mention here. Gilkey's science-influenced interchangeable use of the terms *symbol* and *myth* complements Torrance's view that in Theological Science language is symbolic and falls short of an exhaustive description of reality. However, Gilkey's view of a unity of objectivity and subjectivity beyond science, which can be expressed only through mythology, seems incompatible with Torrance's view. Gilkey proposes a science-influenced subjective mythical projection of the nature of ultimate reality, while Torrance proposes its objective scientific apprehension.[2]

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[1]Brian Walsh argues that Gilkey is not critical enough of the oppressive character of modernity (274). See also Kyle A. Pasewark, "Power, Freedon, and History: The Symbol of Divine Providence in Langdon Gilkey's Theology," in *The Theology of Langdon B. Gilkey* (1999), 303-334.

[2]Torrance and Gilkey respectively reflect Kant and Plato in spite of the fact that they seek to overcome Kant's subjectivism and Plato's idealism. See Torrance, *Theological Science,* 26ff., 92-92; idem, *Transformation and Convergence,* 245; Gilkey, *Nature, Reality, and the Sacred,*

Conceivably one could provisionally use Gilkey's science-influenced perspective on myth in Theological Prolegomena in order to make the concept of Positive Theology meaningful to the secular mind. However, once the task of scientific Positive Theology is undertaken from Torrance's perspective, the concepts concerning myth developed in the Prolegomena would have to be rejected.

Both Torrance's and Gilkey's surveys of the history of science indicate that they are responsive to the postmodern shift. In the next section, the comparison and contrast of their responsiveness will be further explored. This will be done in terms of their views on the history of the use of science in theology.

The History of the Use of Science in Theology[1]

Comparison and Contrast

Responsiveness to the postmodern shift is also evident in the comparison and contrast of Torrance's and Gilkey's discussion of the history of the use of science in theology. They are comparable in that they discuss this history against the background of the premodern, modern, and postmodern periods. However, they are contrasted in their

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43-73, 125-129; idem, *Religion and the Scientific Future,* 8.

[1]See sections in chapters 1-3 on The History of Science and The History of Its Use in Theology.

different emphases, which are, nevertheless, complementary.

First, Gilkey describes the final shift in the history of the use of science in theology in terms of the liberal, neoorthodox, and post-neoorthodox models of theology. Torrance similarly discusses the liberal/neo-protestant approach and post-neoorthodox approaches (extreme liberal and orthodox approaches along with various mediating models). Both theologians perceive positive elements and significant flaws in these models. Gilkey, more than Torrance, welcomes the fact that the impact of science helps make traditional methods of theological construction insufficient.

Second, for Torrance, the history of the use of science in theology has been characterized by progress in overcoming theological dualism. Gilkey also accepts the historical use of science in overcoming theological dualism. He suggests that the biblical concept of creation repudiates the dualistic[1] as well as the monistic and pantheist views of

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[1]Gilkey, *Maker of Heaven and Earth*, 48. Gilkey traces dualism from premodern myths, to the Orphic cosmologies and its purification in the Platonic picture of creation which was the ground of Aristotle's cosmology, to Gnosticism and to the philosophy of Whitehead. Dualism presupposes the formal principle of structure and the material that is structured as two independent and yet complementary principles. Thus the creator is good but finite, and matter is evil (ibid., 47-50).

creation.[1] However, while Gilkey repudiates an "absolute dualism," he accepts a "relative dualism."[2] For Gilkey, there is a fine line between monism and dualism in all authentic theology. This is because, on the one hand, there is a real duality of God and the world, and on the other hand, God is present in the world which is dependent upon God.[3] For Gilkey, the non-dualist presence of God in His creation means that the being as well as the non-being of

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[1]For the monist there is only one reality: God or the world. From the pantheist perspective, God is the world.

[2]Ibid., 197. He complains that "the relative dualism between God and the created world, implicit in the idea of creation and realized in the laws of nature, is by human freedom raised to the absolute dualism between the Holy God and the sinful world of history" (ibid.).

[3]"The transcendence of God [is] expressed by means of the absoluteness of God's being" (Gilkey, *Through the Tempest*, 94-95) as changeless, necessary, impassible, and hence unrelated comes soon enough to contradict the God who creates, preserves and guides a changing world, and participates in that world, and who shares in the suffering, vulnerability, and even the mortality of all creatures (ibid., 95). However, "the affirmation of the reality, goodness, and potential meaning of the world, grounded on the confidence that it had been established by a good God . . . [means] that the real is located here, in the midst of temporal change; that goodness alone inhabits the temporal world, its tasks and vocations; and that fulfillment is increasingly possible in historical time. For such an apprehension or self-understanding a persistent sense of deity is in any case precarious; but a fortiori in such a situation any sense of the reality, goodness, and relevance of a deity quite transcendent of time and change tends to erode" (ibid., 96).

creation are a part of the nature of God.[1] Torrance and Gilkey agree that there is a distinction between God and the world as well as a relation between God and the world. However, they understand this relation differently. For example, Torrance understands this God-world relation as constituted in Christ. Gilkey understands the God-world relation as symbolized in Christ.[2]

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[1]"Creation can more coherently and faithfully (adequate to Christian sources) be understood as also the disclosure of the divine nonbeing" (ibid., 97). God reveals God's self as a mysterious dialectic or polarity of being and nonbeing" (ibid., 98) which dialectically interpenetrates in temporal and changing finite reality (ibid., 99). "Thus is the absoluteness of the Creator qualified in creation. Creation represents not only the positing of being but the self-negation, the self-limitation, of God in order that the authentic, finite being be. God steps back in creation. . . . Creation reveals or discloses a polar aspect of nonbeing as well as being in God, a dialectic of being and nonbeing" (ibid., 100). "Both as Creator and as providential Lord of history, God limits God's self . . . and that self limitation is a disclosure of the polar nature of God as a mysterious dialectic of being and nonbeing" (ibid.).

[2]Gilkey views Christ as a theological symbol, analogy, or myth. As such Christ is an object of theological reflection. On the equivalence of myth, symbol, and analogy in Gilkey's writings see *Message and Existence*, 102; *Religion and the Scientific Future*, 66; and Clifford, 177-178. Mason describes how Gilkey is powerfully attuned to the great Christian symbols of creation, providence, and redemption, and able to interpret them ever anew in the light of crucial secular analysis of experience (Mason, 315). Gilkey's work is theologically theory-laden. Yet he attempts to uncover a religious dimension apart from explicit religious symbolism. This is because the question of truth often preempts the discussion of meaningfulness which is important to apologetics (Gilkey, "Ervaring en interpretatie," 293-302; Shea, 161-173).

Complementarity

Torrance's and Gilkey's responses to the postmodern shift are complementary in that each theologian's emphasis illuminates that of the other. First, both perceive positive and negative elements in postmodern models for the use of science in theology. Second, both regard the postmodern overcoming of theological dualism as a positive trend leading to a recognition of the distinction as well as relation between God and the world.

However, their differing understandings of the implications of this history could only be complementary if a symbolic use of Christ in Theological Prolegomena could be a stepping stone toward the understanding of Christ as the constitution of God-world relations in Positive Theology.

In the next section of this chapter the Christological and cosmological natures of Torrance's and Gilkey's models for use of science will be compared and contrasted.

Christological and Cosmological Models

This section compares and contrasts Torrance's and Gilkey's Christological and cosmological models in terms of their views of science and its use in theology. It also deals with the issue of whether their models for the use of science in theology are complementary.

The Nature of Science[1]

Comparison and Contrast

Any model for the use of science in theology involves a theological view of science. Torrance and Gilkey present their views of science, first, in terms of comparable high views of non-theological Science. For Torrance, science is (1) a dominant force in contemporary culture, (2) a religious operation and a revelation, or medium of revelation. For Gilkey science is (1) a cultural force which is (2) the most reliable way of attaining real knowledge of the world. Science also (3) produces love of truth, authenticity, spiritual experience, and (4) points to ultimate reality, which is God.

Second, there is comparison and contrast of Torrance's and Gilkey's views concerning the limits of science. These limits may be outlined in terms of the grounds and extent of science.

1. For Gilkey, science is limited in that it has non-scientific/religious/intuitive foundations.[2] Similarly,

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[1]See discussion of The Nature of Science in chapters 2 and 3.

[2]Note Rudolf Otto's and Tillich's perspectives on a "mysterium tremendum" and a "mystical *a priori*" that support respectively a religious phenomenological orientation and a philosophical ontological phenomenology. See Rudolf Otto, *The Idea of the Holy* (New York: Oxford University Press, 1950), 60f., 72f., 117f., 149, 155, 160; Tillich, *Systematic*

Torrance grounds natural science in positive or "proper" theology.[1]

2. According to Gilkey, science is not only limited in that some of its theories are grounded in faith/intuition, it is also limited because it cannot deal with the whole world or the whole realm of truth, and because theology provides real nonscientific knowledge.[2] Torrance agrees with these limits of science except that he does not refer to theological knowledge as non-scientific. Rather, he

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Theology, 1:8-17, 76-79, 166, 171, 215-216, 239-240; Thomas Langford, "A Critical Analysis of Paul Tillich's Method of Correlation" (Ph.D. diss., Duke University, 1958), 29-31.

[1]"Far from theology being based on natural science, the opposite, if anything, is nearer the truth!" (Torrance, *Ground and Grammar,* 44). "This [new] science . . . rests upon foundational ideas that science did not and could not have produced on its own, ideas that derive from the Christian understanding of the relation of God to the universe" (ibid., 73). See "The Transformation of Natural Theology," in ibid., 75-109.

Torrance regards "dogmatics" as "proper theology" (ibid., 49). Christian theologians took up and developed premodern dogmatic thought changing it and its foundations (ibid., 50). "Classical Christian theology . . . reconstructed the cultural foundations in philosophy and science upon which the pagan picture of God and the cosmos rested" (ibid., 60). The doctrine of God in patristic theology and given massive exposition by Karl Barth involves the transcendent freedom of God in His love which disposes of any dichotomy between Divine Being and Acting. Such a doctrine of God demands a corresponding notion of the universe (ibid., 67).

[2]For Gilkey, nonscietific knowledge is nonfactual knowledge. This raises a question as to whether that which is nonfactual is real. Again Gilkey seems to be influenced by Kant's distinction of things in themselves (which cannot be known scientifically) and things as they appear.

defines science broadly so as to include theology. However, while Gilkey holds that science and theology are mutually interdependent, he defines science as exclusive of theology. On the substantial issues presented here Torrance and Gilkey seem to be complementary. On the semantic issue of the definitions of science and theology, they are divided.

Third, there is comparison and contrast between Gilkey and Torrance in connection with the relation of science and the sciences. Torrance argues that there is no independent general science, only particular sciences. However, there is, in principle, a general science which is modified for use in each particular science, including Theological Science. There is a degree of complementarity here with Gilkey who does not deny a distinction of general and special sciences or any of the principles of general science proposed by Torrance, or that these principles are modified in theology. However, it seems that Gilkey would regard these principles as inevitably so transformed in theology that theology could not be defined as a science.[1]

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[1]On the modern tendency toward separation of science and theology, see chapter 1. Gilkey and Torrance both reject this tendency. See section above on Responsiveness to the Postmodern Shift.

Complementarity

While there are incompatible elements, there is also significant complementarity between Torrance and Gilkey with regard to their views of science. First, both have a high view of science. Second, Torrance does not deny Gilkey's position concerning the limits of natural science and its need for theology. Third, Gilkey does not deny Torrance's position concerning a general science which is modified for use in each science.

With regard to the second point, on the limits of science, Torrance and Gilkey include intuition in science and theology for apprehension of the ultimate reality of God through Christ and nature, respectively. Elements of these views may be combined within a model that allows for the intuition of ultimate reality through nature and Christ within Positive Theology and through nature alone within Theological Prolegomena.

With regard to the third point, elements of Torrance's broad definition of science as inclusive of natural and Theological Science can incorporate elements of Gilkey's narrower definition of natural science as exclusive of theology. However, Gilkey's rejection of the broader definition of science as demonic is incompatible with Torrance's perspective. One would have to choose between

Torrance and Gilkey at this point. In the next section, Torrance's and Gilkey's models for the use of science in theology will be more directly compared and contrasted.

The Nature of the Use of Science in Theology

In the previous section, Torrance's and Gilkey's views of the nature of science were compared and contrasted. In this section, their models for Christological and cosmological uses of science in theology will be compared and contrasted. Torrance discusses the use of science in theology in terms of a hierarchy of levels[1] of theological truth in Christ, Scripture, and nature. Gilkey discusses this issue in terms of Christ, Scripture, and nature as sources and resources[2] for theology. Therefore, their

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[1]See Stanislav Grof, *The Holotropic Mind: The Three Levels of Human Consciousness and How They Shape Our Lives* (New York: Harper Collins Publishers, 1993).

[2]For discussions of sources for theology see Jerry Korsmeyer, *God-Creature-Revelation: A Neoclassical Framework for Fundamental Theology* (Lanham, MD: University Press of America, 1995); Grace M. Jantzen, "Sources of Religious Knowledge," *Literature and Theology* 10 (1996): 91-111; Carol P. Crist, "Roundtable Discussion: What Are the Sources of My Theology?" *Journal of Feminist Studies in Religion* 1 (1985): 119-131; J. E. Ballagas, "Ellen G. White's Concept of the Hermeneutic Principle--The Bible Its Own Interpreter and Some of the Implications Related to the Use of Secondary Sources in Biblical Investigation" (M.A. project report, Andrews University, 1980); Frederick E. J. Harder, "Revelation as a Source of Knowledge as Conceived by Ellen G. White" (Ph.D. diss., New York University, 1960).

Christological and cosmological perspectives may be outlined in terms of the influence of Christology, Bibliology, and Natural Theology on their models for the use of science in theology. Christology and Natural Theology will be examined first because their models are primarily Christological and cosmological.

Christology and the Use of Science[1]

Comparison and contrast

There is comparison contrast between Torrance's and Gilkey's models for the use of science in theology in terms of the influence of Christology on their models.[2] This comparison and contrast will be surveyed here, following Torrance's lead, in terms of (1) knowledge, (2) science, and (3) the sciences.

First, Torrance's model is Christological in that he has a high view of the knowledge of the living Christ (the essential object of theology) as scientific knowledge. In contrast, while Gilkey's model has a high view of theology as a source of real knowledge,[3] he makes a major distinction

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[1]See sections on Christology in chapters 2 and 3.

[2]Torrance's Christology is more developed than Gilkey's. Torrance has written many articles and books on various aspects of Christology. Compare discussions of Christology in chapters 2 and 3.

[3]Gilkey refers to theological knowledge as symbolic (*Maker of Heaven and Earth,* 133), non-factual (*Religion and*

between the types of knowledge produced by theology and science. The Christological implications are evident in that Gilkey regards Christ as primarily a theological symbol and secondarily as an historical figure open to study by historical science.

Second, Torrance's model is Christological in that the principles of formal scientific method are applied to the Christological principles of Theological Science. Gilkey does not seem to deny the possibility of applying formal scientific principles to theology. However, in contrast with Torrance, he regards the definition of theology as a science as a demonic definition.[1] Gilkey's attitude to the non-science character of theology is largely evident in that he does not regard theology as able to establish matters of fact even concerning Christ.

Third, Torrance's model is Christological in that there is a use of special sciences in theology based on their indirect comparison and dialogue between the special

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the Scientific Future, 19), hermeneutical (*Nature, Reality, and the Sacred,* 44), and trans-scientific knowledge ("Theology and Culture," 5) of the depth and mystery of existence ("Theology," 242), of nature as a whole, as creation (*Maker of Heaven and Earth,* 25, 55), and of God's creative and redemptive presence in Jesus (*Message and Existence,* 181).

[1]See previous section. See also Karl E. Peters, "Empirical Theology in the Light of Science," *Zygon* 27 (1992): 297-325.

sciences and his Christological theology. Gilkey does not make the same type of comparison between Christological theology and the sciences. Rather he emphasizes the contrast between his Cosmological-Empirical Theology and scientific knowledge in other sciences.[1]

In contrast to Torrance's Christological model, Gilkey's model is cosmological in that he correlates his Christology with science through Natural Theology in his Theological Prolegomena separate from Positive Theology.[2] In addition, he suggests that this correlation of Christology with science is the place where the use of science in theology is most evident. In other words, the use of science is most evident where it clarifies the symbol of Christ, the ultimate norm of theology. Torrance also coordinates Christology with science and Natural Theology. However, unlike Gilkey, his Natural Theology is internal to and controlled by his Christological Theological Science.[3]

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[1]See section below on Natural Theology and the Use of Science.

[2]This is done in terms of Christ as the solution to the fallenness of the creation. See Gilkey's book, *Message and Existence*.

[3]Torrance writes: "thus the knowing of being is to be acknowledged as an operation of being itself, for it is through being known that the structure of the universe manifests itself" (*Reality and Scientific Theology*, 2). Patterson writes: "The world's inherent rationality (which is grounded in Christ) must include human rationality, for if not, another dualism is being proposed" (28). Patterson

Complementarity

Comparison and contrast between the influence of Christology on Torrance's and Gilkey's models for the use of science in theology implies the possibility of complementarity within a more comprehensive model. In such a model, a non-scientific symbolic Christology correlated with science in Theological Prolegomena (as in Gilkey) may complement an objective, scientific theology of the living Christ coordinated with other sciences in Positive Theology (as in Torrance). The next section compares and contrasts the influence of Natural Theology on Torrance's and Gilkey's models for the use of science in theology.

Natural Theology and the Use of Science[1]

Comparison and contrast

There is comparison and contrast between Torrance's and Gilkey's models for the use of science in terms of the influence of Natural Theology. The discussion of the

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comments on Lindbeck (*The Nature of Doctrine*, 63-65): "It seems that he is regarding Christian truths as either needing justification from beyond or (confusedly) as non-ontological (although propositional) truths. . . . In the Christian context, however, the divinely external must become the divinely internal according to the Christian imperative of incarnation" (Patterson, 37). This is "the lynchpin linking internal and theistic realistic perspectives" (ibid., 40).

[1]See sections on Natural Theology in chapters 2-3.

influence of Natural Theology will be surveyed here in terms of (1) the object of theology, (2) Positive Theology, (3) science-theology relations, (4) theism, (5) facts, and (6) criteria and foundation.

First, Gilkey's model is influenced by Natural Theology in that nature (in terms of human experience of God in nature) is the essential object of theology.[1] In contrast, Torrance regards Christ as the essential object of theology.[2] Gilkey's view might seem to reduce theology to Natural Theology. However, the way in which he avoids this is described in the second point below.

Second, Torrance agrees with Gilkey that there is an influence of Natural Theology on the use of science in theology. However, Torrance places Natural Theology within positive Christological theology as a connecting point between science and theology.[3] In contrast, Gilkey proposes the use of science in a Theological Prolegomena of Natural

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[1]Gilkey rejects privileged appeals to revelation or metaphysical argument and grounds theology in the human experience of the dimension of ultimacy (God) (Gilkey, "Introduction: A Retrospective Glance at My Work," in WIC, 23-24). Religious language, therefore, has a primary reference to human experience and only secondary, symbolic reference to God Himself" (Davis, iv).

[2]See discussion of Christology and the Use of Science in the previous section.

[3]This means a Christological control and limit of the use of science. See section on "Christology" above.

Theology which is external to Positive Theology. Hence theology is not limited to Natural Theology.

For Torrance, theology must be coordinated by Natural Theology not only with science in general but with each science. However, he submits the empirical correlates of theology in Natural Theology to the control of the higher Christological levels of Positive Theology. There is a use for science to test these correlates, but only in harmony with the Christological method.[1] In contrast, Gilkey's emphasis on God in the cosmos leads to a cosmological coordination of science and theology influenced by a Natural Theology which is part of Theological Prolegomena.[2]

Third, Torrance and Gilkey agree that there is no science-theology dichotomy within Natural Theology. Gilkey's external Prolegomena of Natural Theology describes science-theology interrelation as interpenetration on all levels and as an interlocking of science, philosophy, and theology. Torrance's Natural Theology (internal to Positive Theology) puts emphasis on the scientific and philosophical nature of theology itself. On the one hand, Torrance makes

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[1]This means that theology is open upward to God in Christ and coordinated downward to empirical reality in the world. See section on Natural Theology and Other Sciences in chapter 2.

[2]For more on Torrance's and Gilkey's methods of coordination see sections below on the dialogical and dialectical nature of their models for the use of science.

more of a distinction between science and theology in that he refers to science-theology dialogue[1] rather than science-theology interpenetration. On the other hand, there is less of a science-theology distinction in that he refers to theology as a science.

Torrance's inclusion of Natural Theology within Positive Theology allows for nature to be regarded as an essential object for theology along with Christ. As such, use of science facilitates identification of empirical correlates where science and theology overlap in contingency and rationality. Similarly, for Gilkey, the use of science in Natural Theology is essential to Empirical Theology in order to correlate ordinary experience of creation with Creator. Like Torrance, Gilkey holds that there is an overlap between the contingency and rationality of the Creator and the creation and thus a similar overlap of science and theology. This overlap includes scientific and theological credibility. Torrance's model is not incompatible with Gilkey's suggestion that this overlap is supported by the contingency of the world of science, which bears traces of the sacred non-contingent reality of God.

Fourth, for Gilkey, Natural Theology (within Theological Prolegomena) abstracts from science the

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[1]See discussion of dialogue below.

principles of being and exercises faith in the sacred traces evident in science. This leads to a theism which is credible but nontraditional. In comparison with Gilkey, Torrance regards theological statements in Positive Theology as having co-reference to the being of God and to created being.[1] Torrance also uses Natural Theology within Positive Theology to correlate[2] the knowledge of created being and the knowledge of divine being.[3] As a result, in contrast to Gilkey, Torrance's Natural Theology supports a theism which is more traditional. He regards theism as credible, not only because of its correlation with other sciences (like Gilkey), but primarily because it is a theologically scientific theism (unlike Gilkey).

Fifth, for Gilkey, the coordination of science and theology is influenced by a prolegomena of Natural Theology in that his theology involves interpretation of the facts

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[1]Torrance places emphasis on the logic of theology and science and on existence and coherence statements. See *Reality and Evangelical Theology,* 152-153; *Theological Science,* 204-222, 326-327; "The Logic and Analogic of Biblical and Theological Statements in the Greek Fathers," *Theology in Reconstruction,* 30-45). Also Errol E. Harris, *Formal, Transcendental and Dialectical Thinking: Logic and Reality* (Albany, NY: State University of New York Press, 1987); Hartshorne, *Man's Vision of God and the Logic of Theism.*

[2]See discussion of Dialogical and Dialectic Uses of Science below.

[3]Torrance, *Reality and Scientific Theology,* 33-36, 52.

(theories/conclusions) of science. Theology does not establish facts but rather explicates facts (established by science) from a religious perspective. Torrance also allows for the interpretation of science in his internal Natural Theology. However, he has a different approach to matters of fact. He allows for a limited use of science for direct comparison with theology where they focus on the same factual issues.[1] He also holds that theology deals with facts that are not subject to evaluation by other sciences and that theology must not subject itself to interpretations of facts developed in other sciences.[2]

Sixth, the influence of Natural Theology prolegomena on the use of science in theology is evident in Gilkey's reference to the need for Natural Theology to proceed in harmony with scientific criteria from the natural sciences. He also refers to science as a ground and foundation for theology.[3] In contrast, Torrance's inclusion of Natural Theology within Positive Theology leads him to reject the use of non-Theological Science as a norm or foundation theology. He views Christ as the sole ultimate norm for Christian theology. As a result, divine revelation in

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[1]Torrance, *Theological Science,* 284-285.

[2]Ibid., 319-320

[3]On science as ground or foundation for theology see Gilkey's *Religion and the Scientific Future,* 37, 62.

nature is interpreted Christologically even within Natural Theology.[1]

Complementarity

Torrance's and Gilkey's models for the use of science in theology are comparable. They both propose a Natural Theology where there is science-theology distinction without dichotomy, and overlap and correlation between science and theology with regard to objects, contingency, and rationality. Also they agree that Natural Theology does not establish matters of fact but focuses on the use of science to identify empirical correlates.

This agreement may imply that other apparently incongruent elements of their models may be combined within a more comprehensive model. Such a model might link a dominant role for Christology in Positive Theology as an influence on the use of science (as in Torrance) with a dominant role for Natural Theology as an influence on the use of science in Theological Prolegomena (as in Gilkey).

In such a comprehensive model:

1. The use of science may be influenced by the fact that Christ and nature may be essential objects of theology.

2. Torrance's scientific/philosophical theology may

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[1]Torrance, *Theological Science,* 112; idem, *Transformation and Convergence,* 249-250.

complement Gilkey's links between science, theology, and philosophy.

3. The use of science that supports traditional theism in Positive Theology may complement the use of science to support non-traditional theism in Theological Prolegomena.

4. Science may provide a norm/criteria and ground/foundation for external Natural Theology while a scientific positive theology operates according to its Christological norm/criteria/ground/foundation.

5. In addition, facts established by scientific theology may be complementary to facts established by other sciences.

The Christological and cosmological characteristics of Torrance's and Gilkey's models for the use of science in theology have now been compared and contrasted. This has suggested the possibility of complementarity between them. This may allow for a master hybridizing model where Christ is dominant within Positive Theology while Nature is dominant within Natural Theological Prolegomena. Complementarity is also implied in their claims that their models are faithful to the perspective of Scripture. In the next section, the influence of Torrance's and Gilkey's Bibliologies on their models for the use of science will be compared and contrasted for complementarity.

Bibliology and the Use of Science[1]

Comparison and contrast

There is comparison and contrast between Torrance's and Gilkey's models for the use of science in theology in terms of the influence of Bibliology on their models. The discussion of the influence of Bibliology may be surveyed in terms of (1) revelations/sources/norms, (2) meanings, (3) starting points, and (4) historical science.

First, both theologians agree that Scripture is a unique[2] source and norm[3] of theology among other sources and

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[1]See sections on Bibliology in chapters 2-3.

[2]The comparison and contrast between Torrance and Gilkey with regard to Scripture as a source of theology reflects elements of the contrast between Barth and Tillich. Contrast is evident in that, on the one hand, Barth suggests that Scripture is the source and norm of theology which impresses itself on the theologian independent of any other ground. On the other hand, Tillich suggests that Scripture is the first and most basic (but not the only) source of theology because it is the original witness to the revelational event on which the Church is grounded. Comparison is evident in that, on the one hand, for Barth, the words of the Bible are not simply the word of God since God is sovereign over the Bible. Similarly, for Tillich, the Bible is not propositional revelation. Rather it points to the revelatory event to which it bears witness. See Barth, *Church Dogmatics,* vol. I-1, *The Doctrine of the Word of God,* 120f.; Tillich, *Systematic Theology,* 1:34-38.

[3]Frederick Ferré, "Cosmos: Child of Science? Theoretical Intelligence and Epistemic Norms," *Philosophy of Religion* 31 (1992): 149-163; 165-176; Jean Ladrière, "On the Notion of Criterion," in *Is Being Human a Criterion of Being Christian*? ed. Jean-Pierre Jossua and Claude Geffré (New York: Seabury Press, 1982), 10-15; Will Herberg, "Biblical Realism as a Norm," in *Colleges and Commitments*

norms. While Christ is referred to as a material norm (Torrance) or ultimate norm (Gilkey), Torrance regards Scripture as the formal norm for theology. Similarly Gilkey views Scripture as a dependent revelation which preserves the originating revelation of Christ. However, he also seems to reduce Christ to a biblical symbol, making Scripture a more important influence on his model than Christ.[1] Torrance also regards Scripture language about Christ as symbolic. However, for him, Scripture language points to the objective revelation of Christ as an extrabiblical and primary influence on his model.[2]

Second, Gilkey describes his model in language that he claims respects the original (eidetic) meaning of the language of Scripture.[3] Torrance's model displays the same respect for Scripture language/meaning. However, their

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(Philadelphia: Westminster Press, 1971), 150-167; Joseph F. Mitros, "Norm of Faith in the Patristic Age," *Theological Studies* 29 (1968): 444-447; Mary A. Stenger, "Paul Tillich's Theory of Theological Norms and the Problems of Relativism and Subjectivism," *Journal of Religion* 62 (1982): 359-375.

[1]On the other hand, Torrance identifies our apprehension of Christ with Scripture.

[2]Torrance is not sufficiently clear about relations between a personal-existential apprehension of Christ and an objective-cognitive apprehension of Christ.

[3]For Gilkey's definition of eidetic meaning see sections on Biblical Theology as Hermeneutical Discipline and Biblical and Systematic Theology in chapter 3. Brian Walsh questions Gilkey's eidetic faithfulness and reflective coherence (275-276).

models suggest that they propose very different interpretations of the original meaning of Scripture. This is evident in that they propose different revelations of God (in Christ [Torrance] or in nature [Gilkey]) as the scope, object, subject matter, and cannon of Scripture.

Third, as a result, Torrance regards the *Scripture-related revelation of God in Christ* as the starting point for his model for the use of science in theology. On the other hand, Gilkey regards *the Scripture-related revelation of God in nature* as the starting point for his model. It seems then that Scripture could function as norm to evaluate their models.[1] However, Torrance refers to a gap between

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[1]On the relation of the starting point of theology to theology in general, Sue Patterson writes: "The relation of Christian theology to the models with which it interacts may be expressed in terms of relative power or priority, dynamics, and stability (the maintainability of priority) (Patterson, 5). "If a particular reality is both unique and primary, namely the reality of Jesus Christ . . . then the particular must be prior to the general. The particular must set the boundaries of the real world. The general may only be abstracted from the particular in a secondary way" (ibid., 60). "Yet the general principles will continue to inform the particular hermeneutics, for . . . hermeneutical methods and tools are generalizable to situations of use other than the one or ones in which they were developed. . . . The general is always realized in the specific, but the specific cannot be reduced to the general without disappearing, as Colin Gunton points out (*The One, the Three and the Many* [Cambridge: Cambridge University Press, 1993], 2-3). If 'it is the function or role of sciptural texts to give persons and groups both a world and a sense of how to carry on in it' (Kort, 'Reading a Text', 7) the world given by Christian Scripture absorbs various hermeneutical theories and methods" (Patterson, 60-61, n. 17).

the truth of Christ and Scripture. Gilkey would seem to agree that there is a similar gap between the truth of Scripture and nature. As a result, Torrance proposes the hermeneutical use of scientific method in theology in terms of a contrapuntal method where interpretations of Christ and Scripture are revised in light of each other and where Scripture itself is revised in the light of Christ. Gilkey seems to hold a similar position. Interpretations of cosmos and Scripture are to be revised in light of each other. Further, Scripture itself is to be revised in light of the cosmos and its interpretations. Nevertheless, both Torrance and Gilkey refer to the sense in which there is a parity between the two interpretive tasks.[1]

Fourth, Bibliology influences Torrance's model for the use of historical science to clarify relations between

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[1]On the one hand, Torrance seems to propose a priority of Christological phenomenology over the hermeneutics of Scripture interpretation. However, he also seems to allow for a parity of both tasks in that Christ is not known apart from his revelation in Scripture in the Church within the cosmos. On the other hand, Gilkey proposes a priority of the hermeneutical phenomenology of science over the hermeneutics of Scripture interpretation which seems related to Theological Prolegomena. However, he also proposes a parity of the two hermeneutical tasks which seems related to theology proper. On the relationships of Systematic Theology and Biblical Theology, see Louis Berkhof, "Theology as a Science," in *Introduction to Systematic Theology* (Grand Rapids, MI: Baker, 1979), 44-48; J. I. Packer, "Is Systematic Theology a Mirage?" in *Doing Theology in Today's World*, ed. John D. Woodbridge and Thomas Edward McComiskey (Grand Rapids, MI: Zondervan, 1991), 19-21.

interpreter, Scripture text, inspired writers, and Christ. He seems to reject some traditional presuppositions of the historical-critical method which he transforms into his historical-theological method. Both Gilkey and Torrance regard the use of historical science as largely supportive of the historicity of Scripture. Nevertheless, Gilkey's use of historical science focuses on the evaluation of the factual accuracy of Scripture in terms of facts/meaning derived from the scientific study of common experience. Gilkey seems to accept more of the traditional presuppositions of the historical-critical method. This supports his view that Scripture language is symbolic in reference to God. It also supports his nontraditional Christology and Natural Theology.[1]

Complementarity

The influence of Bibliology on Torrance's and Gilkey's models may be compared in that:

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[1]Torrance's Christology and his doctrine of creation are more traditional than Gilkey's. However, both theologians undermine the traditional doctrine of creation by accepting the evolutionary perspective of science. See Torrance's *Ground and Grammar,* 111; *The Christian Frame of Mind,* 22; *Divine and Contingent Order,* 1, 18ff., 73; *Christian Theology and Scientific Culture,* 115; *Space, Time and Incarnation,* 89-90; *Space, Time and Resurrection,* 23; *Transformation and Convergence,* 281-282. See also Gilkey's "The Concept of Providence in Contemporary Theology," 171-172; *Nature, Reality, and the Sacred,* 100, 128.

1. Both theologians agree that what Gilkey calls the original meaning of Scripture is a norm for the use of science in theology.

2. Their views of Scripture as formal or preserving revelation over against the revelations of Christ and/or cosmos, which are norms for the use of science, seem complementary.

3. Within a more comprehensive model for the use of science, Scripture may be interpreted in contrapuntal relation to both Christ, as apprehended in Theological Science, and the cosmos, as apprehended by theological and/or non-theological sciences.

4. In addition, their scientific historical-critical and historical-theological methods may have complementary functions in Theological Prolegomena and Positive Theology respectively. Use of scientific historical-critical method, even in Theological Prolegomena, undermines many of the factual claims of traditional Christian theology. However, according to Gilkey, scientific, historical criticism reveals traces of the sacred. This may persuade the secular mind of the need to enter the world of Positive Theology where Torrance's scientific historical-theological method will establish the broader range of meaning and theological fact through theological language.

In this section of this chapter Torrance's and Gilkey's

models for the use of science in theology have been surveyed in terms of the comparison, contrast, and complementarity of the Christological and Cosmological nature of their models. Both theologians regard their models as influenced by Scripture. However, the differences between their models are influenced by their Christological and cosmological perspectives respectively. This is based on the order of revelation in Christ and nature, which are then interpreted in Scripture.

As an alternative to Torrance's and Gilkey's models, it may be argued that the epistemological order of knowledge in theology should begin with the revealed interpretations of Christ and nature which are provided in Scripture.[1] This calls for a biblical model for the use of science which could incorporate the Christological and cosmological emphases of Torrance and Gilkey. Such a model would also stand in contrast with elements of Torrance's and Gilkey's models. Some possible contours of such a more comprehensive revelational model will be suggested in chapter 5.

However, another matter remains to be addressed before turning to the issues of chapter 5. In the next section of this chapter, the dialogical and dialectical/correlational

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[1]Harink holds that Torrance fundamentally confuses the order of revelation-God, Christ, Spirit, history, Scripture-and the reverse order of knowledge (Harink, 119-131).

nature of Torrance's and Gilkey's models will be compared and contrasted in terms of the specific uses for science in theology which they propose.

Dialogical and Dialectical Use of Science in Theology

This section compares and contrasts Torrance's dialogical model and Gilkey's dialectical/correlational model in terms of their proposals of specific uses of scientific method and scientific theory in theology. It assesses the complementarity of these models by comparing and contrasting (1) the limits of the dialogical and the dialectical/correlational models for the use of science in theology, and (2) the extent of the specific dialogical and dialectical uses of scientific method and scientific theory.

The Limits of Dialogue and Dialectic

Comparison and Contrast

Torrance and Gilkey are contrasted in that they propose dialogical and dialectical models respectively for the use of science in theology.[1] However, they are comparable in that both of their models limit the use of science in

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[1]See sections on "The Basic Nature of the Model" in chapters 2-3.

theology. On the one hand, Torrance proposes a dialogue[1] of science and theology in which some elements of other sciences are not used in theology. On the other hand, Gilkey proposes a dialectic[2] of science and theology which, like Torrance's model, involves affirmation as well as negation of the use of science.

Nevertheless Torrance's dialogical model and Gilkey's dialectical/correlational model are contrasted further in that they tend to emphasize the limited use of different aspects of science. Torrance's philosophy of theology limits the use of scientific theory and emphasizes the use of scientific method. This is evident in his proposal that theology is a science with a scientific method. Gilkey limits the use of scientific method and emphasizes the use of scientific theory. This is evident in his proposal that

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[1]Mooney, "Theology and Science," 289-329; Jeffrey S. Wicken, "Theology and Science in an Evolving Cosmos: A Need for Dialogue," *Zygon* 23 (1988): 45-55; David B. Burrell, "God, Religious Pluralism, and Dialogic Encounter," in *Reconstructing Christian Theology*, ed. Rebecca S. Chopp and Mark Lewis Taylor (Minneapolis, MN: Augsburg Fortress, 1994). Compare Gilkey's use of the term *dialogue* in "The Spirit and the Discovery of the Truth Through Dialogue," in *Experience of the Spirit*, ed. Peter Huizing and William Bassett (New York: Seabury Press, 1974), 58-68.

[2]Gustav E. Mueller, *Dialectic: A Way into and Within Philosophy* (New York: Bookman Associates, 1953); James M. Robinson, ed., *The Beginnings of Dialectical Theology*, trans. Keith R. Crim and Louis De Grazia (Richmond, VA: John Knox Press, 1962).

Empirical Theology is not scientific in its method but interprets the "facts"/theories of science.

Another contrast between the two theologians may be found in the terms of their discussion. Torrance discusses the dialogical limits of the use of science in terms of (1) historical science and the natural sciences. However, Gilkey discusses the dialectical limits in terms of (2) a distinction between demonic and authentic use(s) of science.

First, with regard to the limited dialogical use of science, Torrance dialogically transforms historical-critical method into historical-theological method and objective natural scientific method into the objective method of Theological Science/Positive Theology. The dialogical use of science is proposed because of (a) the similarities and differences between other sciences and theology, (b) the fact that these disciplines all function in one world, and (c) because theology operates in objective dialogue with a personal God who reveals His word to us. Gilkey seems to accept the first two points. However, he seems to reject the concept of actual dialogue with God.

Gilkey's dialectical model seems to exclude the use of scientific method in theology. However, since nonscientific theology apprehends the same reality as does historical science, he does dialectically use historical-critical science in Positive Theology. For the same reason, he uses

natural science dialectically in his philosophical phenomenology as a Prolegomena to Positive Theology. This use of science is proposed because both scientific and non-scientific theological perspectives are necessary for a complete understanding of God, the Being of all reality.

Second, on the one hand, with regard to the limited dialectical use of science, Gilkey's description of a demonic use of science (in defining theology as a science) seems to reject Torrance's model for the use of science in theology.[1] On the other hand, Torrance's description of dialectic theology comes close to a designation of it as demonic.[2] However, Gilkey's description of authentic use of science in dialectic correlation with theology may be compared and contrasted with Torrance's dialogical model. There is comparison in that Torrance accepts the need for interrelation of theology with science. However, there is significant contrast in that interrelation with science is for Torrance a dialogue between other sciences and the science of theology rather than, as for Gilkey, a dialectic or correlation of science with non-scientific theology or with Theological Prolegomena.

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[1]See section on "Demonic Correlation" in chapter 3.

[2]Torrance, *Theological Science,* 7, 17, 42, 125-161, 141, 157, 307; *Christian Theology and Scientific Culture,* 117-119.

Complementarity

There are major incompatibilities between Torrance's and Gilkey's models for the use of science. Gilkey proposes that Theological Science is demonic and that dialectic with scientific theories[1] is pursued within Positive Theology. These proposals are incompatible with Torrance's model of dialogical-theological scientific method. Torrance's scientific dialogue with God is also incompatible with Gilkey's science-influenced dialectic with the being of God. This incompatibility between Torrance and Gilkey cannot be dissolved simply by using one model for the use of science in Theological Prolegomena and another model in Positive Theology.

However, some elements of their models could be combined into a more comprehensive model. First, though Gilkey's model is dialectic, he explicitly refers to a need for "dialogue" between theology and cultural life (including science). Similarly, while Torrance condemns the use of science in "dialectic" theology,[2] his model for the use of science in theology has been described by some of his interpreters as significantly "dialectical."[3]

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[1]Gilkey, *Nature, Reality, and the Sacred,* 75-76. See section on "Use for Scientific Theory" below.

[2]See Torrance, *Theological Science.*

[3]Henry, 3:214.

Second, there is complementarity between Torrance's emphasis on scientific method(s) and Gilkey's emphasis on scientific theories. For Torrance, the dialogical model for the use of science includes direct dialogue with formal scientific methods which make theology scientific. However, this model is also indirectly influenced by the material methods of other sciences through the dialogue of Positive Theology with scientific theories from other sciences.[1] Similarly, Gilkey's dialectical model for the use of science rejects the use of the formal methods of science but is influenced by those methods indirectly through the dialectic between scientific theories[2] and theological symbols.

Third, both Torrance and Gilkey affirm and limit the use of science in theology because of similarities and differences in their operations in one world. Gilkey's dialectical use of scientific theory in Natural Theology Prolegomena may complement Torrance's dialogical use of scientific method in Positive Theology.

The complementarity of Torrance's and Gilkey's dialogical and dialectical models may be further clarified

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[1]See discussion of direct, indirect, and complex use of science in theology in the summary at the end of chapter 1. Also see the next section below.

[2]The use of scientific theories inevitably reflects on the methods that produced them. Lindon Eaves, "Spirit, Method and Content in Science and Religion: The Theological Perspective of a Geneticist," *Zygon* 24 (1989): 185-215.

by comparison and contrast of their proposals of specific uses of science in theology in the next sections.

The Extent of Dialogue and Dialectic[1]

In this section, Torrance's and Gilkey's proposals of uses of scientific method and scientific theory are compared and contrasted for complementarity.[2] This will provide further evidence as to whether dialogical use of science in Positive Theology (including Natural Theology) may complement dialectical use of science in Natural Theology Prolegomena and in Positive Theology.

The Use of Scientific Method[3]

In harmony with his proposal that theology is scientific in its method, Torrance has proposed a larger number of uses for scientific method than Gilkey. However, even though Gilkey does not view theology as a science, he proposes uses for scientific method in theology. In the discussion below, Torrance's twenty dialogical uses and Gilkey's nine dialectical uses are consolidated into seven composite uses of scientific method.

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[1]See sections on uses of "Scientific Methods" in chapters 2-3.

[2]Some uses of scientific method and theory overlap.

[3]See relevant sections of chapters 2-3.

1. *Necessity and Relevance: Scientific method may be used to show the necessity and relevance of Positive Theology.* Gilkey's Natural Theology Prolegomena argues that scientific method involves faith and religious ultimacy which can only be expressed in religious language in a Positive Theology. This complements the implication of Torrance's model in which the scientific method is useful in the study of the object of Positive Theology. This shows the necessity for theology and its relevance in our scientific culture. However, Torrance and Gilkey differ on the issue of whether the Positive Theology supported by scientific method is nonscientific or a scientific.

2. *Problem Solving: Scientific method may be used to facilitate the solution of problems in Natural and Positive theology.* One such problem is the decline of theology into ideology and pseudo-science. This proposal implies that Torrance's Natural Theology within dialogical Positive Theology may be partially compatible with Gilkey's Natural Theology within dialectical Theological Prolegomena. This is because both theologians suggest that Natural Theology deals with and sometimes removes problems arising from other sciences. Gilkey agrees with Torrance that today science presents less problems for theology than in the past.

However, a major incompatibility arises with regard to

the problem of ideology and pseudoscience. On the one hand, for Torrance, use of formal scientific method facilitates solution of problems in a dialogical Theological Science. Distinctions and similarities between science and theology can help free Theological Science from false scientific principles and ideologies. On the other hand, Gilkey makes a distinction between scientific and theological methods. Therefore, he denies that theology is scientific. Rather, the dialectical use of scientific theory will help theology reject the futile attempt to be scientific. Therefore the idea of Theological Science is regarded by Gilkey as evidence of pseudoscience.[1]

With regard to the issue of science and pseudoscience, Torrance's and Gilkey's views are so different that they can be complementary only if one or the other or both views are adjusted or qualified. The adjustment or qualification would be minimal if one regards Torrance's larger definition of science (inclusive of Theological Science) as also inclusive of Gilkey's narrower definition of natural science and other sciences (as exclusive of theology).

3. *Epistemological Illumination: Scientific method may be used to illuminate objective and subjective relations between the knower, knowing, and known in Natural Theology*

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[1]See section on "Demonic Correlation" in chapter 3.

Prolegomena and in Positive Theology (including Natural Theology). On the one hand, there is a comparison between dialogical and dialectical models for the use of science in connection with this proposal. Torrance refers to the use of science in theology in terms of a scientific objectivity distinct from and yet inclusive of subjectivity. Similarly, Gilkey holds that scientific objectivity is related to subjectivity.[1] He also refers to different but interpenetrating levels of theological cognition which are illuminated by science. In principle, this seems to undermine Gilkey's rejection of the use of science in a Natural Theology which is included within Positive Theology.

On the other hand, there is a contrast between Torrance and Gilkey with regard to the use of science in the objective apprehension of God. First, for Gilkey, the non-symbolic identification of God with the being and non-being of all reality is regarded as an objective but nonscientific apprehension of God.[2] In contrast, for Torrance, there is

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[1]This means that the use of science in theology is different from what it would be if a traditional conception of scientific objectivity without subjectivity were proposed.

[2]For Gilkey, being, in general, which is divine, includes elements of non-being. Therefore, "theology and metaphysics . . . are seeking the same 'object' [being]" (*Maker of Heaven and Earth*, 35). "While other things 'have' existence, God 'is' existence" (ibid., 81). Gilkey follows Tillich with regard to God as being. For Tillich, "being-

an objective and scientific apprehension of God in Christ rather than simply through being in general.[1]

Second, Gilkey seems to deny that objectivity (even a revised model of scientific objectivity) characterizes relations between the theologian and *God as a being* (which for Gilkey is a symbolic concept). In contrast, Torrance regards *God as a being* as the object and the subject matter of scientific theology. He argues that God is objectively and scientifically available as Dogma so that there is a use for science in the theological production of dogmas.[2]

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itself" is the "mystical *a priori*" of perennial philosophy, religious knowledge, and all knowledge. This is in harmony with the Platonic tradition. However, Tillich seems to have been directly influenced by Schleiermacher and Troeltsch. This *a priori* knowledge of God is not the knowledge of a being. But it is the first, only absolute, certain, self-evident knowledge. This knowledge precedes reason and is its ground. Being-in-Itself is the non-symbolic ground of all symbolic theological language. Tillich, 1:8-12, 42, 79-80, 158, 166, 238-240; Langford, "A Critical Analysis," 16-35.

[1]Torrance insists that the transcendent reality not be reduced to the created reality. Gilkey agrees with this in principle. However, Torrance might accuse Gilkey of having done such a reduction in practice. In contrast Gilkey might accuse Torrance of being too other-worldly in his theology.

[2]"In *dogma* we are concerned with the one ultimate ground and creative source of the understanding and existence of the Church in the communication and self-giving of God's own Being, and therefore with the ontological unity of the Church in one God. . . . In *dogmas*, however, . . . the Church strives to understand its own foundation and to clarify the pattern of its life and mission on that foundation. We are concerned with dogma as the objective meaning and norm of all true dogmas" (Torrance, *Theological*

Nevertheless, with regard to the two points of contrast discussed above, there seems to be the possibility of complementarity. First, like Gilkey, Torrance does regard theological and Christological statements as referring to created and un-created realities. This leaves open the issue of whether created reality might be understood (as Gilkey suggests) in terms of the dialectical use of science in a Prolegomena of Natural Theology external to Positive Theology.

Second, Torrance's view that there is always an ontological gap between dogmas and Dogma seems open to questioning from Gilkey's perspective as to the extent to which God—the Dogma of theology—is objectively available. If God is to some extent not objectively available, then He is to that same extent not subject to scientific study. Again a nonscientific dialectical apprehension of God in an external Natural Theology might be considered.

4. *Facilitating Critical Realism: Scientific method may be used to facilitate critical realism,*[1] *openness, and*

Science, 344-345).

[1]Ibid., 9; idem, "Theological Realism," in *The Philosophical Frontiers of Christian Theology: Essays Presented to D. M. Mackinnon,* ed. Brian Hebblewaite and Stewart Sutherland (Cambridge: Cambridge University Press, 1982), 169-196; idem, "Realism and Openness in Scientific Inquiry," *Zygon* 23, no. 2 (1988): 159-169. Also Paul Feyerabend, *Realism, Rationalism and the Scientific Method:*

humility[1] *in Natural Theology Prolegomena and in Positive Theology (including Natural Theology).* Both Torrance and Gilkey accept the insights of critical realism in philosophy which corrects, incorporates, and goes beyond the subjective insights of Kant.[2] Torrance complains that Kant's critical philosophy denies any real knowledge of things in themselves. For Torrance, critical realism corrects this oversight.[3] Critical realism is also evident in Gilkey's

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Philosophical Papers, 2 vols. (Cambridge: Cambridge University Press, 1985); Michael Mutsuo Yanase, *Meeting God Through Science: Hidden Realism*, trans. William Johnston (Tokyo: S.J. House, 1991); Ingolf U. Dalferth, "Karl Barth's Eschatological Realism," in *Karl Barth: Centenary Essays*, ed. S. W. Sykes (Cambridge: Cambridge University Press, 1989).

[1]Torrance, *Divine and Contingent Order*, 11. See idem, *The Christian Frame of Mind: Reason, Order, and Openness in Theology and Natural Science.*

[2]Langdon Gilkey, "Whatever Happened to Immanuel Kant?" in *The Church and Contemporary Cosmology: Proceedings of a Consultation of the Presbyterian Church (U.S.A.)*, ed. James B. Miller and Kenneth E. McCall (Pittsburgh: Carnegie Mellon University Press, 1990); Kant, *Critique of Pure Reason;* idem, *Reason Within the Limits of Reason Alone* (New York: Harper and Row, 1960).

[3]The "mechanistic outlook was reinforced by Kant when he transferred absolute time and space from the Mind of God to the mind of man—which meant that in natural science we do not read laws of nature out of nature but read them into nature—and thereby universalized Newtonian determinism to cover all human experience. Moreover, when Kant correlated his 'Copernican revolution' with a denial of any knowledge of things in themselves and a limitation of reason to things as they appear to us, he gave rise to a metaphysical apophaticism . . . which had the effect of excluding God from any interaction with the world and of severing faith

proposal that the notion of human participation in reality is the way out of Kant's subjectivity.[1] Gilkey has in mind a human participation in Being (which is God).[2] Torrance also accepts the principle of participation in reality. He discusses science in terms of a "basic order into which our thought is forced under the pressure of objective reality."[3] However, with regard to Theological Science he emphasizes the intuitive apprehension of the universal truth of God which is in the unique man Jesus. Therefore, it seems that Torrance's and Gilkey's proposals concerning the use of science and critical realism are generally complementary.

Closely related to the issue of critical realism is the issue of theological openness and humility. First, Torrance

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from reason" (Torrance, *The Christian Frame of Mind,* 109-110).

[1]Gilkey, *Nature, Reality, and the Sacred,* 71. "Critical philosophers . . . depart from Kant to explore, by way of an 'analogical metaphysics,' the actuality from which science has abstracted signs" (ibid.). The mystical *a priori* is self-evident. For Tillich awareness of the unconditional being-in-Itself is "unconditional." The participation of humanity in the ultimate reality is an unreserved giving of the self. Religious experience is the awareness of an identity which exists between the experiencing subject and ultimate reality. See Tillich, *Systematic Theology,* 1:9, 76-79, 158, 172, 207; Langford, "A Critical Analysis," 23-28.

[2]See Torrance, *Through the Tempest,* 98-99.

[3]Torrance, *Theological Science,* 116-117.

places emphasis on openness to revelation in Christ[1] as the starting point for theology. In contrast, Gilkey places emphasis on revelation in nature[2] as the starting point for theology.[3] Nevertheless, there is room for complementarity. On the one hand, Gilkey suggests that in a sense the Christ of Scripture is the ultimate norm of theology. For Gilkey, as for Torrance, there is a certain theological priority of symbolic/personal Christological statements about God.[4] On the other hand, Torrance (like Gilkey) suggests that empirical correlation with that which may be studied by other sciences is needed in order to maintain the objective

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[1]Henry Vander Goot, ed., *Creation and Method: Critical Essays on Christocentric Theology* (Washington, DC: University Press of America, 1981); H. P. Owen, "The Scope of Natural Revelation in Rom 1 and Acts 17," *New Testament Studies* 5 (1958-1959): 133-143.

[2]See also James Barr, *Biblical Faith and Natural Theology* (Oxford: Clarendon Press, 1993).

[3]See also Melvin R. Keiser, "Beginning Where We Are: The Postcritical Starting Point of Systematic Theology," *Religion and Intellectual Life* 5 (1988): 75-92; D. Bruce Lockerbie, "Thinking Like a Christian, Part 1: The Starting Point," *Bibliotheca Sacra* 143 (1986): 3-13.

[4]For Gilkey, "as Christians we know God as the source of our existence only when we first know him to be the love that will not let us go" (*Maker of Heaven and Earth,* 294). Further, "it is unwise to try to dispense with either the ontological tradition [God as being] and the more personal [Christian] tradition" [God as a being] (ibid., 101).

connection of theology with reality.[1]

Second, Torrance and Gilkey agree that just as science is always revisable in the light of new evidence, so theology is to be revisable in the light of ongoing study of revelation and/or its media. For Gilkey, the objective revelation of God as being, which is mediated in part through scientific study of nature, is the basis of revision of theological statements, including Scripture statements. Torrance also allows for such revision of theological statements and Scripture. However, his emphasis is on Christ as the norm for this revision.[2] Both theologians have a place for general revelation (nature) and special revelation (Scripture, Christ) in their models. Therefore, their respective perspectives on Natural Theology Prolegomena and Positive Theology and on the dialectical and the dialogical use of science could very well be complementary.

5. *Assessing Facticity: Scientific method (historical-critical or historical-theological) may be used to assess, evaluate, or demonstrate the historical/factual accuracy or*

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[1]Torrance, *Christian Theology and Scientific Culture,* 115.

[2]Torrance does not reject revision of theological concepts in light of Scripture. However, his method emphasizes revision of Scripture in light of Christ (*Reality and Evangelical Theology,* 70-71).

inaccuracy of religious language, including Scripture language. Torrance and Gilkey may be compared in that Gilkey, like Torrance, brings scientific method into the study of Scripture within Positive Theology through the use of the historical-critical method. In addition, they both use scientific historical-critical method[1] to assess factual accuracy[2] in theology. However, there are contrasts between them with regard to this issue. On the one hand, Gilkey denies that theology can contribute to establishing any matter of fact. Thus he proposes an external Natural

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[1]On the historical-critical method, see Roy A. Harrisville and Walter Sundberg, *The Bible in Modern Culture: Theology and Historical-Critical Method from Spinoza to Käsemann* (Grand Rapids, MI: Eerdmans, 1995); David L. Schindler, "Theology and the Historical-Critical Claims of Modernity: On the Need for Metaphysics," *Comunio* 6 (1976): 73-94; O. O. Edwards, "Historical-Critical Method's Failure of Nerve and a Prescription for a Tonic: A Review of Some Recent Literature," *American Theological Review* 59 (1977): 115-134; Gerhard Hasel, "The Origin of the Biblical Sabbath and the Historical-Critical Method: A Methodological Test Case," *JATS* 4, no. 1 (Spring 1993): 17-46; Larry Herr, "Genesis One in Historical-Critical Perspective," *Spectrum* 13 (December 1982): 51-62; Jerry Gladson, "Taming Historical Criticism: Adventist Biblical Scholarship in the Land of the Giants," *Spectrum* 18 (April 1988): 19-34; Eta Linnemann, *Historical Criticism of the Bible: Methodology or Ideology?*; idem, "Historical-Critical and Evangelical Theology," *JATS* 5, no. 2 (Autumn 1994): 19-36; Peter Stuhlmacher, *How to Do Biblical Theology* (Allison Park, PA: Pickwick Publications, 1995); Gerhard Maier, *Biblical Hermeneutics* (Wheaton, IL: Crossway Books, 1994).

[2]On faith and fact, see Rheinallt Nantlais Williams, *Faith, Facts, History, Science and How They Fit Together* (Wheaton, IL: Tyndale, 1974); John Warwick Montgomery, *Faith Founded on Fact* (New York: Thomas Nelson, 1978).

Theology which includes analysis of the scientific view of common experience. He also proposes a dialectic/correlation between religious symbols/myths and scientific facts. On the other hand, Torrance adjusts the historical-critical method into an historical-theological method which does not limit facts in theology to matters determined by other sciences. Also, Torrance views theology as more grounded in historical fact than does Gilkey.[1] Finally, Torrance and Gilkey differ in their views on the results of the use science to evaluate the historicity of theological language. Torrance regards theological language as more factual than does Gilkey.

There seems to be an inconsistency in Gilkey's use of scientific historical-critical method in Positive Theology since he does not regard theology as a science. He claims that theology has nothing to do with establishing matters of fact. This seems to indicate that the historical-critical study of Scripture is as external to Positive Theology as is his Natural Theology. In contrast, Torrance's historical-theological method clearly and consistently includes the

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[1]They both suggest that scientific method (that is, the material method of other sciences) is not to be used where theology focuses on the truth of God beyond history. Thus there is a sense in which there is what Torrance calls a methodological exclusion between theology and other sciences. See section above on "The Nature of the Use of Science in Theology."

scientific study of Scripture within his scientific Positive Theology along with Natural Theology.

This raises the question as to whether Gilkey's historical-critical method is complementary to Torrance's historical-theological method. This may be so if Gilkey's historical-critical study of Scripture is understood as part of an external Natural Theology which demonstrates to the secular mind the need for a scientific Positive Theology open to additional scientific evidence through a historical-theological method. The issue of the relation of theology to matters of fact will be further explored below.

6. *Explaining Theological Language: Scientific method may be used to clarify the use of religious/theological language, communication, and articulation, especially with regard to analogy.*[1] Possible complementarity between Torrance's and Gilkey's perspectives may be suggested, first, in the fact that the distinction between their

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[1]See Wayne C. Booth, "Systematic Wonder: The Rhetoric of Religion," *Journal of the American Academy of Religion* 53, no. 4 (1985): 677-702; Frederick Ferré, *Language, Logic, and God* (New York: Harper, 1961); H. G. Hubbeling, *Language, Logic and Criterion* (Amsterdam: Born N.V., 1971); Randolph Crump Miller, *The Language Gap and God* (Philadelphia: Pilgrim Press, 1970); Jean Ladrière, *Language and Belief* (Notre Dame, IN: University of Notre Dame Press, 1972); Hans Kellner, *Language and Historical Representation* (Madison: University of Wisconsin Press, 1989); James Ware, *Not With Words of Wisdom: Performative Language and Liturgy* (Washington, DC: University Press of America, 1981).

positions is not always clear. On the one hand, Gilkey proposes that scientific and theological language are symbolic. He intends this to indicate that they are mythical[1] and analogical. On the other hand, like Gilkey,[2] Torrance regards the use of religious language as analogous to that of scientific language. However, he does not regard the language of science as mythical as Gilkey seems to do, following Tillich.[3] Torrance discusses the use of science

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[1]Gilkey, *Religion and the Scientific Future,* 20. Gilkey also regards scientific language as symbolic or mythical. Gilkey, "Modern Myth-Making and the Possibilities of Twentieth-Century Theology," 1:283-312; idem, "Symbols, Meaning, and the Divine Presence," 249-267. Compare with Torrance, "Incarnation: Myth or Reality," *Scottish Church Society Report* (1972-1980): 12. See also Barbour, *Myths, Models, and Paradigms;* Hinze, "The Notion of Symbol and Its Usage in the Writings of Langdon Gilkey from 1959-1977"; Tyron Inbody, "Myth in Contemporary Theology: The Irreconcilable Issue," *Anglican Theological Review* 58 (April 1976): 139-57; Loretta Dornisch, "Symbolic Systems and the Interpretation of Scripture: An Introduction to the Work of Paul Ricoeur," *Semia* 4 (1975): 1-19; Bernard J. Cooke, *The Distancing of God: The Ambiguity of Symbol in History and Theology* (Minneapolis: Fortress Press, 1990); F. W. Dillstone, ed., *Myth and Symbol* (London: S.P.C.K., 1966); Avery Robert Dulles, *The Craft of Theology: From Symbol to System* (New York: Crossroads, 1992); Sallie McFague, *Metaphorical Theology: Models of God in Religious Language* (Philadelphia: Fortress Press, 1982); Janet Soskice, *Metaphor and Religious Language* (Oxford: Clarendon Press, 1985).

[2]Gilkey, *Religion and the Scientific Future,* 20.

[3]Torrance, *Theological Science,* 288. "We can no longer formulate Christian dogmas without at the same time showing how they are known and expressing the purpose that lies behind them. It would be a grave error to identify them as such with the transcendent form and being of the divine

to provide, evaluate, and clarify theological analogy.[1] He also regards scientific theological language as having a symbolic dimension. However, he rejects mythological theology as prescientific.[2]

Second, there may be complementarity because of their contrasting views of myth. Torrance's basic reason for rejecting the language of myth is his view that myth implies subjective projection of human ideas rather than objective apprehension of personal divine being. However, Gilkey regards myth as an objective apprehension of God as Personal Being in that God is the source of all personal beings.[3]

Similarity between scientific and theological language facilitates dialogue and/or dialectic between these two types of Natural Theology (internal and external) and between external Natural Theology and Positive Theology. Further, the mythological interpretation of religious language in external Natural Theology may be a provisional

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Truth, but it would also be a grave error to treat them as symbolic expressions of our encounter with reality with no ultimate *fundamentum in re*" (ibid.). See Tillich, *Systematic* Theology, 1:283ff., 409ff.

[1]See discussion of analogy in the section on "The Uses of Scientific Theory" below.

[2]Torrance, *Theological Science*, 288.

[3]Torrance rejects Kant and follows Aristotle's realism and intellectualism in knowledge. In contrast, Gilkey follows Kant's departure from intellectualism.

way to demonstrate to the secular mind the need of a Positive Theology which may go beyond the mythical to a factual understanding of religious language.

7. *Identifying Empirical Correlates: Scientific method may be used to identify empirical correlates*[1] *for theology and the common ground*[2] *and unity of science and theology.* This proposal implies that insights from Torrance's and Gilkey's models may be combined into a more comprehensive model with a Natural Theology Prolegomena as well as a Positive Theology which is inclusive of Natural Theology. Gilkey's emphasis on the use of science to evaluate theological facticity (proposal five) is comparable to Torrance's emphasis on the use of science to identify empirical correlates of theology.[3] They agree in their attempt to reject dualism between the divine and historical realms. However, unlike Gilkey, Torrance does not limit

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[1]The issue of empirical correlates may be illuminated by Tillich's method of correlation. See John Powell Clayton, *The Concept of Correlation: Paul Tillich and the Possibility of a Mediating Theology* (New York: W. de Gruyter, 1980); Thomas A. Langford, "A Critical Analysis of Paul Tillich's Method of Correlation." See also Paul D. Hanson, *Dynamic Transcendence: The Correlation of Confessional Heritage and Contemporary Experience in a Biblical Model of Divine Activity* (Philadelphia: Fortress Press, 1978); Burnett Streeter, *Reality: A New Correlation of Science and Religion* (New York: Macmillan, 1926).

[2]Noel, "God-Language Grounded."

[3]Torrance, *Theological Science,* 9.

empirical correlates to what has been established as fact by other sciences. Rather, theological statements are regarded as statements of empirical fact.[1]

For Torrance and Gilkey, the idea of empirical correlates for theology implies a unity between science and theology. For Torrance, this is a unity of dialogue between other sciences and Theological Science. For Gilkey, this is a unity of dialectic between nonscientific theology and other sciences. Either way, the unity between science and theology is facilitated by the common ground between science and theology. Torrance and Gilkey point out that theology and science operate in the same world.

For Torrance, this common ground of science and theology includes the scientific method shared by both disciplines. Therefore, he includes Natural Theology within Positive Theology. For Gilkey, this common ground is the common experience which is interpreted in different ways by science and theology. Therefore, he proposes a Natural Theology Prolegomena to Positive Theology.

Gilkey also proposes the use of science in clarifying

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[1]They "are basically existence-statements in the sense that they refer to the Being and Existence of God as the given Reality. . . . They are empirical statements, in the sense that they arise *a posteriori* out of an actual encounter with objective reality, while the nature of reality determines the kind and mode of empirical reference they involve" (ibid., 174-175).

the ground of religious language. His theological analysis of science shows secular experience to be a ground for religious language. This seems to be incompatible with Torrance's proposal of the ground of religious language in the revelation of Christ in relation to Scripture.[1]

The discussion presented in this section suggests that it is possible that a new comprehensive model with dialectical and dialogical aspects might follow Gilkey's use of scientific method in Theological Prolegomena and Torrance's use of scientific method in Positive Theology. In the next section Torrance's and Gilkey's proposals of uses for scientific theory in theology will be compared and contrasted.

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[1]See *Ground and Grammar;* Russell Stannard, *Grounds for Reasonable Belief,* ed. Thomas Torrance (Edinburgh: Scottish Academic Press, 1989). Nevertheless, Torrance's discussion provides a point of contact with Gilkey's grounding of theology through his Natural Theology of creation (see chapter 3 above). Torrance writes: "A fuller title . . . would be 'The Ground and Grammar of a Realist Theology in the Perspective of a Unitary Understanding of Creation" (*Ground and Grammar,* ix). "God and the created universe . . . are mutually affected by each other. Conversely, a unitary outlook upon the created universe and the doctrine of God as the one creative Source of all order in the universe are profoundly interconnected. . . . Man as man of science and man of faith, is called to be the priest of creation. That is the context in which . . . Theological Science and natural science are found to overlap with one another at profound points" (ibid., ix-x).

The Use of Scientific Theory[1]

In spite of Gilkey's relatively larger emphasis (than Torrance) on the uses of scientific theory in theology, most of Gilkey's proposed uses are specifically identifiable in the writings of Torrance. As in the previous section, a survey of these proposals will show whether Torrance's dialogical use of science in his Positive Theology (including Natural Theology) complements Gilkey's dialectical use of science in his Prolegomena of Natural Theology and in his Positive Theology. In the discussion below, Torrance's sixteen dialogical uses for scientific theory and Gilkey's eleven dialectic uses are consolidated into six composite uses.

1. *Relevance and Necessity: Scientific theory may be used to show the necessity and relevance of a Natural Theology Prolegomena and a Positive Theology (including Natural Theology) in order to be open to God and fundamentally related/correlated to the universe and in order to avoid formalism.*[2] One of the ways that the use of

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[1]See relevant sections of chapters 2-3.

[2]Pailin, "Natural Theology"; Paul Avis, "Does Natural Theology Exist?" *Theology* 87 (1984): 431-437; Barr, *Biblical Faith and Natural Theology;* Charles L. Birch, *Nature and God* (London: SCM Press, 1965); Steve Bishop, "Review of *Biblical Faith and Natural Theology* by Barr," *Science and Christian Belief* 6, no. 2 (1994): 147-148; Wolfhart Pannenberg, *Toward a Theology of Nature: Essays on Science and Faith*

scientific theory in Natural Theology shows the need for Positive Theology is through scientific limit questions.[1] For Gilkey, limit questions are an example of theological questions arising from science which can be answered only by theology. There seems to be no incompatibility between Torrance and Gilkey in relation to this use of science in order to show the need for Positive Theology. However, unlike Gilkey, Torrance regards theological answers to limit questions arising from science as scientific answers.

The possible compatibility of Torrance's and Gilkey's models within a more comprehensive model is also evident in their discussions of the use of science to help theology be properly related to both God and the world. First, they agree that the use of scientific theory may help theology to be open to God, unfold knowledge of God, be faithful to God,

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(Louisville, KY: Westminster/John Knox Press, 1993); Olaf Pederson, *The Book of Nature* (Notre Dame: University of Notre Dame Press, 1992); Joseph Sittler, "Nature and Grace: Reflections on an Old Rubric," *Dialog* 3 (Fall 1964): 252-256; William Temple, *Nature, Man and God* (New York: St. Martin's Press, 1956); Robert A. Wild, "Creation in the Teaching of Paul," *The Bible Today* 26 (1988): 146-155; Max Wildiers, *A Theologian and His Universe* (New York: Seabury Press, 1982).

[1]See David Tracy, *Blessed Rage for Order: The New Pluralism in Theology* (San Francisco: Harper and Row, 1988); George E. Tracy, "Limit Language: A Deeper Heritage," *Worship* 50 (1976): 206-213.

draw nearer to God, and appropriate the revelation of God.[1] However, they disagree in that, on the one hand, Gilkey defines his Positive Theology in terms of dialectic and correlation. This indicates that, in a sense, he includes elements of his dialectical/correlational Natural Theology within his Positive Theology. On the other hand, Torrance regards the use of science in Positive Theology as dialogical rather than as dialectical.

Second, Torrance and Gilkey agree that scientific theory helps theology to be fundamentally related to the universe. This is important because theology and science operate in the same world. However, there are differences between Torrance and Gilkey with regard to facts and empirical correlates in science and theology.

For Gilkey, the fundamental attitude of theology to the universe is largely determined by the "facts" of science. He argues that theology does not establish any matters of fact. In contrast, Torrance allows for theology to

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[1]See David Ray Grifin, ed., *Spirituality and Society: Postmodern Visions* (Albany, NY: State University of New York Press, 1988); idem, *Sacred Interconnections: Postmodern Spirituality, Political Economy, and Art* (Albany, NY: State University of New York Press, 1990); John Baillie, *Natural Science and the Spiritual Life* (New York: Charles Scribner's Sons, 1952); Imants Baruss, *Authentic Knowing: The Convergence of Science and Spiritual Aspiration* (W. Lafayette, IN: Purdue Research Foundation, 1996); Peter H. van Ness, *Spirituality and the Secular Quest* (New York: Crossroad, 1996).

establish some matters of fact. A combination of these insights could involve provisional acceptance of the standards of facticity in other sciences in an external Natural Theology. This could be combined with acceptance of the relevance of the issue of facts in Positive Theology.

Further, Torrance suggests that there is a need for the use of empirical correlates in connection with every aspect of theology because God is revealed in the world. Similarly, for Gilkey, the pervasive use of empirical correlates seems required by the definition of theology as the interpretation of common experience. There may be a complementarity between the emphases on revelation and common experience, respectively. This is possible if external Natural Theology is only provisional and apologetic in its refusal to begin with the assumption of revelation. The idea of revelation can then be taken up in a Natural Theology which is internal to Positive Theology.

Finally, to avoid theological formalism, Torrance brings Natural Theology into Positive Theology. However, he rejects the idea of a total constraint of theology by its empirical correlates. This is because all theological statements are understood to fall short of the truth of God. Gilkey seems to imply a total constraint of science (through an external Natural Theology) over theological articulation in terms of factual issues. However, he also argues that

Positive Theology provides answers which only theology can give. Hence, there is a sense in which both theologians would agree that the attitude to the universe in theology is not completely determined by other sciences.

2. *Concepts, Beliefs, Methods: Scientific theory may be used to make a critical and constructive contribution to theology at the basic level of controlling beliefs and concepts;*[1] *to help theology purify its concepts and language from pseudo-science;*[2] *and to clarify its conceptual tradition and its way of thinking and formulating.*[3] To the extent that Torrance and Gilkey agree with this use of science they both include such use in Natural Theology as well as in Positive theology. This implies that there may

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[1]Frederick Ludwig Herzog, "The Possibility of Theological Understanding: An Inquiry into the Presuppositions of Hermeneutics in Theology" (Th.D. diss., Princeton Theological Seminary, 1953); Canale, *A Criticism of Theological Reason: Time and Timelessness as Theological Presuppositions;* David Ray Griffin and Huston Smith, *Primordial Truth and Postmodern Theology* (Albany, NY: State University of New York Press, 1989).

[2]Mario Bunge, "What Is Pseudoscience?" *The Skeptical Inquirer* 9 (Fall 1984): 36-46; Raymond A. Eve and Dana Dunn, "High School Biology Teachers and Pseudoscientific Belief: Passing It On?" 13 (Spring 1989): 260-263; Carl Sagan, "Does Truth Matter? Science, Pseudoscience, and Civilization," 20, no. 2 (March/April 1996): 28-33; Steven N. Shore, "Scientific Creationism: The Social Agenda of a Pseudoscience," ibid., 17 (Fall 1992): 70-72.

[3]Torrance, *Christian Theology and Scientific Culture,* 27-39.

be a complementarity between them within a comprehensive model inclusive of Natural Theology internal and external to Positive Theology. Even the disagreements between Torrance and Gilkey may be compatible in a model which is tolerant to tensions between Prolegomena and Positive Theology.

Torrance and Gilkey agree that the use of scientific theory contributes to the controlling beliefs and concepts of theology. For Torrance, this use is dialogical in that theology influences and is influenced by science. This clarifies a common ground of basic controlling beliefs and concepts. Nevertheless, this use of scientific theory also clearly distinguishes science and theology and therefore points to the limits of the use of science in theology.

Gilkey holds that the basic/controlling beliefs of science are to be used in theology. However, unlike Torrance, he describes this use of science as dialectical. In addition, Torrance and Gilkey seem to have different views of some of the controlling beliefs and concepts of science. As a result, they have different views of the pseudoscience from which theology needs to be purified.

Gilkey allows for questions arising from science to clarify the conceptual traditions of theology. For example, as a result of accepting conclusions from science, he holds that theological concepts do not have to do primarily with matters of fact. Torrance holds that, since theology and

science operate in the same world, theology must deal with counter questions arising from other sciences. However, Torrance does not subordinate theology to the conclusions of science concerning facts as much as does Gilkey.

For Torrance, as for Gilkey, theological method and theory are influenced by scientific theory. However, for Gilkey, science reminds theology that theology is not scientific in its method and cannot establish matters of fact with its theories. In contrast, for Torrance, science clarifies the scientific nature of theological method and theological theory does incorporate matters of fact.

3. *Grounding Constructive Growth: Scientific theory may be used to help theology take root and grow within scientific culture*[1] *which provides the context for fresh theological construction.*[2] For Torrance, this seems to

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[1]Torrance, *Christian Theology and Scientific Culture;* idem, *The Mediation of Christ: Evangelical Theology and Scientific Culture* (Edinburgh: T & T Clark, 1992).

[2]Thomas Torrance, "Christian Theology in the Context of Scientific Revolution," in *Pluralisme et Oecumenisme en Recherches Théologiques,* Mélanges offerts au R. P. Dockx, O. P., by Y. Congar et al., *Bibliotheca Ephemeridum Theologicarum Lovaniensium,* 43 (Paris-Gembloux: Éditions Duculot, 1976), 295-311; Stephen B. Bevans, *Models of Contextual Theology* (Maryknoll, NY: Orbis Books, 1993); Francis O. Schmitt, "A Prescription for Generating a New Paradigm in the Context of Science and Theology," *Zygon* 27 (1992): 437-454; Henry Schwartz, *Method and Context as Problems for Contemporary Theology: Doing Theology in an Alien World* (Lewiston: Edwin Mellen Press, 1991); E. S.

imply a partial grounding of theology in science. For Gilkey, the partial grounding of theology in science is explicit. For Torrance, Positive Theology is rooted and growing in scientific culture as one of the sciences. However, it is also grounded in its object, which is Christ. For Gilkey, there is a sense in which Positive Theology is grounded in science through its Natural Theology Prolegomena. This is in part because of the view that the object of theology is the general revelation of God.

For Torrance, the context for theology is as wide as creation. Therefore there must be fresh theological construction which shows the relevance of Positive Theology in the context of contemporary scientific understanding. Gilkey agrees with this. However, Torrance qualifies this with an emphasis on the dialogical, scientific method of theological construction. In contrast, Gilkey emphasizes fresh theological construction in dialectic or correlation with the unquestioned facts of science.

Elements of their models may be combined within a more comprehensive model which more fully accepts revelation in

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Fiorenza, "The Bible, the Global Context, and the Discipleship of Equals," in *Reconstructing Christian Theology*, ed. Rebecca S. Chopp and Mark Taylor (Minneapolis, MN: Augsburg Fortress, 1994), 79-87; Hilary Regan and Alan J. Torrance, eds., *Christ and Context: The Confrontation between Gospel and Culture* (Edinburgh: T & T Clark, 1993).

Christ and in nature as part of a complex foundation and context for theology.[1] This could also be compatible with an external Natural Theology Prolegomena as well as with a Natural Theology which is internal to Positive Theology.

4. *Object, Center, Subject, Structure: Scientific theory may be used as part of the object*[2] *of theology. As such it influences the content, substance,*[3] *and structure*[4] *of theology.* Along with the emphasis on theological method, Torrance seems to suggest that scientific theory is part of the object of Positive Theology. For Gilkey, the concept of creation as context for theology clearly indicates that scientific theory is an object for Positive Theology. As such, scientific theory influences the content, substance, and structure of theology. Here their models for the use of science in theology are complementary.

However, there are differences between Torrance and Gilkey with regard to this issue. For Gilkey, other sciences evaluate the factual content of theological

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[1]See chapter 5.

[2]James Brown, *Subject and Object in Modern Theology* (New York: Macmillan, 1955).

[3]Thomas Torrance, "The Substance of the Faith: A Clarification of the Concept in the Church of Scotland," *SJT* 36, no. 3 (1983): 327-338.

[4]See Gilkey, *Message and Existence,* 50-53.

statements. For Torrance, it is Theological Science alone which controls the content and substance of theology. In addition, for Gilkey, scientific theory clarifies the structure of theology by establishing all matters of fact with which theology is to be dialectically correlated. Torrance allows much less for the facts of science to influence the structure of theology. These apparently incompatible positions may be complementary if they are applied differently to Natural Theology Prolegomena and Positive Theology (including Natural Theology).

The complementarity of Torrance's and Gilkey's models for the use of science is also evident in a similar dynamic with regard to their different revelatory grounds in Christ and in nature respectively. These grounds influence the structure of their theology and their models for the use of science. Torrance interprets theology and Scripture in light of Christ, while Gilkey interprets them in terms of nature as understood by the sciences. These similar dynamics may be combined within a comprehensive model which includes Christ and nature as material revelations which influence the structure of Natural and Positive Theology.[1]

5. *Criticize and Maintain Authority: Scientific theory may be used to criticize and help maintain theological*

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[1]See discussion in chapter 5.

authority.[1] *This is evident in that scientific theory explains and validates*[2] *theological theory.* This use for science may be outlined in four points. First, for Gilkey, this use of science is more clear in that science clarifies the nature and extent of theological authority with regard to facts.[3] For Torrance, this use of science is not emphasized, and appears minimal. He regards theological seeking after scientific authority from other sciences as a betrayal of theology.[4]

Second, Gilkey's view of the use of scientific theory in establishing theological authority is also evident in his suggestion that, in one sense, theological theory should be treated as scientific theory is treated. However, this

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[1]On authority in theology see William Schweiker and Per M. Anderson, eds., *Worldviews and Warrants: Plurality and Authority in Theology* (Lanham, MD: University Press of America, 1987); Delwin Brown, "Struggle Till Daybreak: On the Nature of Authority in Theology," *The Journal of Religion* 65 (January 1985): 15-32; Jeffrey Stout, *The Flight from Authority: Religion, Morality, and the Quest for Autonomy* (Notre Dame: University of Notre Dame Press, 1981); Bernard Ramm, *The Pattern of Religious Authority* (Grand Rapids, MI: Eerdmans, 1959); Charles Augustus Briggs, *The Bible the Church and the Reason: The Three Great Fountains of Divine Authority* (New York: Scribner's, 1892).

[2]Daniel Winthrop Hackmann, "Validation and Truth: Wolfhart Pannenberg and the Scientific Status of Theology" (Ph.D. diss., University of Iowa, 1989).

[3]See Gilkey, *Message and Existence,* 50-53.

[4]Torrance, *Theological Science,* 282, n. 1.

seems to be incompatible with the concept of a Prolegomena of Natural Theology in which theological theories are not treated as theories in other sciences because the scientific status of theology is not presupposed. Similarly, Torrance's model for the use of formal but not material methods of science in scientific Positive Theology suggests that its theories may, in a sense, be treated as theories in other sciences.

Third, Gilkey mentions that scientific theory explains theological theory, though not "exhaustively."[1] In contrast, Torrance does not refer to the use of theories from other sciences in the explanation of theological theory. Fourth, for Gilkey, validation by science is one level of the validation of theological theory. For Torrance, there seems to be no use of other sciences in the validation of theological theory except in the assessment of the facticity of theological statements. Gilkey's views are applicable to scientific explanation/validation of the factual dimensions of theological language in Natural Theology Prolegomena. Torrance's views are applicable to scientific theological explanation/validation within Positive Theology. Certain issues raised here, such as

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[1]Gilkey, *Nature, Reality, and the Sacred,* 41.

assessment, validation, and explanation, are further discussed in proposal six.

6. *Assess Facticity: Scientific theory may influence the shift of theological truth away from matters of fact, evaluate the facticity of theology, separate fact from symbol in theological language, and explain theological symbols.* This use of science may also be outlined in four points. First, Gilkey argues that scientific theory influences the shift of theology away from matters of fact. However, Torrance does not agree that this is a healthy use for science in theology. Theology should not depend on science to tell it its proper object and subject. Neither should science have the final word in theology with regard to what is factual and what is not.

Second, both Torrance and Gilkey seem to acknowledge the use of scientific theory in evaluating the facticity of theological language. However, in practice, they view the impact of this use of science differently. For Gilkey, science has undermined the traditional view that theological language deals primarily with matters of fact. Torrance allows for a use of science in evaluating factual statements of theology. However, he does not distinguish science and theology in terms of matters of fact.

Third, Torrance and Gilkey agree that in theology there is a distinction between a factual and a symbolic dimension. However, for Torrance, the distinction of theological fact and symbol and the meaning of theological symbol is not uncovered by the use of theories from other sciences but by the scientific method of theology. Also, unlike Gilkey, Torrance would not allow for science to impose on theology its standards of facticity in the explanation of theological symbols. However, like Torrance, Gilkey regards the identification of symbolic meaning as a theological task rather than simply an imposition of science on theology.

Nevertheless, fourth, both theologians agree that scientific analogies are used to help explain theology by describing God's relations to the world. However, for Torrance, the origin of the use of analogies for this purpose did not arise from the impact of scientific theory.[1] Rather, analogy arises out of objective apprehension of God which cannot be described literally. For Gilkey, analogy seems to arise out of the subjective apprehension of God and is descriptive of the human experience of God rather than the actual nature of God. The differences between Torrance and Gilkey here seem to be a matter of emphasis rather than

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[1]For Gilkey, the concept of a relation between God and the world is symbolic, mythical, and analogical. For Torrance, it is symbolic and analogical but not mythical.

contradiction. They both relativize the distinction between objective and subjective knowledge.

With regard to the four points on the assessment of facticity, Gilkey's position implies a use for science in Natural Theology Prolegomena as well as in Positive Theology since both these disciplines have responded to the shift with regard to matters of fact. Torrance's position implies the use of science in Natural Theology (included within Positive Theology) with regard to these matters.

This leads to a conclusion similar to that reached at the end of the previous section on the use of scientific method. It seems that the dialectical and dialogical aspects of a new comprehensive model might follow Gilkey's use of scientific theory in Theological Prolegomena and Torrance's use of scientific theory in Positive Theology.

Summary

This fourth chapter began with a brief survey of the comparison and contrast of the biographies of Torrance and Gilkey and their introductions of their models for the use of science in theology. Then it evaluated their models by comparison and contrast for complementarity. This was done in order to discover which elements of their models may be combined in a more comprehensive model which includes a role for Natural Theology within Theological Prolegomena as well

as a role for Natural Theology within Positive Theology. No recommendation of such a combination is implied here. The aim is to evaluate each model in the light of the other.

In this summary, special attention is given to (1) Torrance's and Gilkey's responsiveness to the postmodern shift, (2) the respective Christological and cosmological emphases of their models, and (3) the respective dialogical and dialectic character of their models.

First, there are complementary elements in Torrance's and Gilkey's responsiveness to the postmodern shift. This is evident in their different but complementary discussions of shifts in the history of science. In this connection they discuss (1) scientists, philosophers, and theologians who are postmodern; and (2) shifts in objectivity, subjectivity, dualism, unitary thinking, and presuppositions of science.

A major incompatibility in these discussions has to do with their discussions of the history of myth in connection with the history of science. Torrance has a negative assessment, while Gilkey has a positive assessment of the role of myth. These perspectives may complement each other only if Gilkey's view is regarded as provisional with regard to the use of science in Prolegomena as preparation for Torrance's view of the use of science in Positive Theology.

Complementary responsiveness to the postmodern shift is also evident in their discussions of the history of the use of science. This is surveyed in terms of the use of science in liberal, neoorthodox, and postneoorthodox theology. They agree that the use of science helps theology to overcome dualism and that there is a duality of God and the world. However, they differ over whether the relationship of God and the world is constituted or only symbolized by Christ.

Second, important complementary elements are apparent in Torrance's and Gilkey's respective Christological and cosmological models. In this chapter, these models were introduced by a discussion of their views of the nature of science. This is because any model for the use of science in theology involves a theological view of science. They both have high views of non-theological science. However, they also agree that science is limited in that it is grounded in intuitive apprehension of non-scientific realities and it cannot deal with the whole of reality. Finally, they agree that there is a distinction between general science and particular sciences.

After examining Torrance's and Gilkey's view of the nature of science, this chapter examined their models for the nature of the use of science in theology. These models were outlined in terms of how they were influenced by Christology, Bibliology, and Natural Theology.

With regard to Christology, the two models differ over whether knowledge of Christ is scientific (Torrance) or not (Gilkey). The scientific nature of Christology is described by Torrance in terms of the applicability of five formal principles of science. Gilkey regards the idea of theology as a science as demonic. Torrance proposes dialogue between Theological Science and other special sciences with regard to the living Christ. Gilkey proposes correlation of symbolic Christology with other sciences through a Theological Prolegomena. In a more comprehensive model, a non-scientific symbolic Christology correlated with science in Theological Prolegomena may complement an objective, scientific theology of the living Christ coordinated with other sciences in Positive Theology.

With regard to Natural Theology, the two models differ over (1) whether Christ or nature is the essential object of theology and therefore the norm for the use of science; (2) whether the use of science in Natural Theology is part of Positive Theology or Theological Prolegomena; (3) whether sacred traces uncovered by science lead to a non-traditional theism or whether the use of science in natural Theology supports a traditional theism; (4) whether or not the use of science in theology establishes any matters of fact; and (5) whether or not science provides criteria, ground, and foundation for theology. Both models reject science-

theology dichotomy and allow empirical correlates for theology and an interpretation of scientific facts.

In a more comprehensive model with an external Natural Theology and an internal Natural Theology, (1) the use of science in theology may be influenced by both Christ and nature as objects for theology, (2) scientific and philosophical theology may complement links between science, philosophy, and theology, (3) traditional theism supported by theological science may complement a provisional non-traditional theism supported by non-theological science, (4) theological and non-theological science may or may not provide criteria, ground, and foundation for Theological Prolegomena or Positive Theology, and (5) facts may be established by both science and theology.

With regard to Bibliology, both models agree that (1) Scripture, as a formal or dependent/preserving revelation, is unique among other sources/norms for the use of science in theology; and that (2) the original meaning of Scripture is to be respected as a norm for the use of science in theology, but may be revised. As a result, they propose different science-influenced contrapuntal interpretations of Scripture in line with either the Scripture-related revelation of God in Christ or in nature. Torrance's use of historical-critical science rejects some of its traditional presuppositions in his historical-theological method, which

supports a more traditional theology. Gilkey's use of an unmodified traditional historical-critical science supports a less traditional theology. Scientific historical-critical and historical-theological methods may be used respectively in both Theological Prolegomenon and in Positive Theology.

Third, and finally, important complementary elements are apparent in Torrance's and Gilkey's dialogical and dialectical models for the use of science in theology. Both of these very different models propose limits to the use of science in theology. Torrance emphasizes direct dialogical use of scientific method, while his theology is indirectly influenced by scientific theory through dialogue with other sciences. Gilkey emphasizes the dialectical use of scientific theory and is inevitably indirectly influenced by the scientific method which produced scientific theory. Nevertheless, Gilkey refers to a dialogue between theology and cultural life (including science). In addition, Torrance's model for the use of science has been described by some as significantly dialectical.

In spite of the differences between their models, Torrance and Gilkey propose uses for science in theology which may be consolidated into seven composite uses for scientific method and six composite uses for scientific theory. Therefore, in a comprehensive dialogical-dialectical model scientific method may be used to (1) show

the necessity and relevance of Positive Theology, (2) facilitate solution of problems in Natural Theology and Positive Theology such as decline into ideology and pseudoscience, (3) illuminate objective and subjective relations between the knower, knowing, and what is known, (4) facilitate critical realism, openness, and humility, (5) assess, evaluate, or demonstrate facticity, (6) clarify the use of theological language, communication, articulation, and analogy, and (7) clarify empirical correlates for theology and the common ground and unity of science and theology.

In addition, in a comprehensive dialogical-dialectical model, scientific theory may be used to (1) show the necessity and relevance of a Natural Theology Prolegomena and a Positive Theology (including Natural Theology) in order to be open to God and fundamentally related/correlated to the universe and in order to avoid formalism; (2) make a critical and constructive contribution to theology at the basic level of controlling beliefs and concepts and to help theology purify its concepts and language from pseudoscience; (3) clarify theology's conceptual tradition, and way of thinking and formulating, and help theology take root and grow within scientific culture which provides the context for fresh theological construction; (4) constitute part of the object of theology and therefore influence its

content, substance, and structure; (5) criticize and help maintain theological authority; and (6) influence the shift of theological truth away from matters of fact, evaluate the facticity of theology, separate fact from symbol in theological language, and explain theological symbols.

Conclusion

In light of the issues surveyed above, the following conclusions seem warranted. First, some comparable elements of Torrance's and Gilkey's models for the use of science in theology could fit in a complementary way into either of their models as they now stand. Second, it is possible to use some comparable and contrasting elements of their models within a more comprehensive model. In such a model, Natural Theology Prolegomena (like Gilkey's) may be external to a Positive Theology (like Torrance's or Gilkey's). It should be noted that this dissertation does not recommend such a composite model. It only suggests that such a model is possible. Third, however, the use of science in both types of Positive Theology could not be reconciled. For Torrance, there is a dialogical use of science in Positive Theology which is inclusive of its own Natural Theology. For Gilkey, there is a dialectical use of science in a Positive Theology which does not include Natural Theology.

This leads to the question of whether a Positive Theology which is different from Torrance's or Gilkey's might point the way beyond a simple combination of the maximum number of insights from their models for the use of science in theology. In addition, could such a model for the use of science in theology be compatible with Torrance's and Gilkey's major emphases on (1) responsiveness to the postmodern shift, (2) Christological and cosmological scope, and (3) dialogical and dialectical methodology?

In chapter 5, this dissertation is summarized along with its implications for a more comprehensive revelational and complementarity model for the use of science in theology. It will be argued that a more comprehensive and complementary model may be grounded in a more biblical Positive Theology than that of Torrance or Gilkey. Further, this need not involve an entire rejection of Torrance's and Gilkey's Christological and cosmological emphases.

CHAPTER V

THE USE OF SCIENCE IN THEOLOGY: SUMMARY AND CONCLUSION

Chapter 1 of this dissertation introduced the problem of the use of science in the writings of Thomas Torrance and Langdon Gilkey. It also described the historical background to this problem. Chapters 2 and 3 have shown that their models for the use of science in theology are (1) responsive to the postmodern shift, (2) influenced primarily by Christology and Natural Theology respectively, and (3) characterized respectively by dialogical and dialectical uses of scientific methods and theories.

Chapter 4 compared and contrasted Torrance's and Gilkey's models for the use of science in theology in order to show whether or not they are complementary to each other. First, it was suggested that some comparable elements of their models could fit in a complementary way into either of their models as they now stand. Second, it was suggested that other comparable and contrasting elements of their models could be complementary when combined within a model which is more comprehensive than the models they have

developed. Such a comprehensive model for the use of science in theology could include use of science (1) in Natural Theology within Theological Prolegomena (following Gilkey) as well as (2) in Natural Theology within Positive Theology (following Torrance).[1] Third, it was suggested that it is difficult to include all the contrasting elements of Torrance's and Gilkey's models in a complementary way in a model which attempts to be faithful to the basic characteristics of each of their models.

A Key Issue for an Alternative Model

This chapter 5 is a provisional response to the limits of the simple combination of Torrance's and Gilkey's models into a more comprehensive model for the use of science in theology. This chapter suggests some possible contours of an alternative model that goes beyond a mere combination of their models.

A key issue which seems to call for such a critical move is the place of Bibliology in such a model. Torrance and Gilkey each propose a Christology, a Natural Theology, and a Bibliology which support their models for the use of science in theology. However, in the process they seem to minimize the biblical perspective because their Christology

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[1]It should be noted that this dissertation does not recommend such a composite model. It only suggests that such a model is possible.

and Natural Theology dominate their Bibliology. This allows for the raising of the following question. Can the biblical perspective guide the modeling of the use of science in theology?

This issue may be clarified through questions arising out of the three major areas of evaluation of Torrance's and Gilkey's models.

1. Is the biblical perspective a viable approach to a model for the use of science in theology in this postmodern era? How responsive could such a model be to postmodern deconstruction/construction of Christological and cosmological models for the use of science in theology?

2. Can a biblical model be Christological and cosmological (that is comprehensively revelational)? In other words can a biblical Christology and cosmology guide the construction of a viable model for the use of science in theology?[1]

3. Can a biblical model support a scientific dialogical theological use of science (as in Torrance) and a non-scientific dialectical theological use of science (as in Gilkey)? In other words, can a biblical model support

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[1]See section below on "Toward a Biblical Christocentric and Cosmological Model."

complementary use of dialogue and dialectic?[1] These questions will be explored separately below.

Toward a Biblical Response to the Postmodern Shift[2]

It seems that there may be value in going beyond Torrance's and Gilkey's responsiveness to the postmodern shift. This option may be clarified be restating the elements in their response to the postmodern shift in terms of the postmodern concepts of deconstruction/construction. This makes possible the identification of the key biblical issue arising from their response to the postmodern shift.

First, Torrance and Gilkey describe the premodern, modern, and postmodern history of factual science and the history of its use in theology in terms which are in part similar to postmodern philosophers of science and theology. As such they seem to be engaged in the deconstruction of certain modern histories/philosophies of science which view science in isolation from its premodern roots and downplay the significance of postmodern developments in science.

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[1]The term *complementarity* is used to describe models for the use of science in theology which are intermediate between dialogical and dialectical models. See the section on "Introduction" in chapter 4.

[2]The discussion here is based on the premodern, modern, and postmodern historical background to the use of science in theology reviewed in chapter 1 and on the discussions of "Responsiveness to the Postmodern Shift" in chapters 2-4.

Second, Torrance and Gilkey not only provide different and complementary descriptions of the history of science and its use in theology, they both accept as well as reject aspects of postmodern models for the use of science. As such they reinterpret or deconstruct destructive postmodernism. In doing so they seem to point the way toward constructive postmodern models.

Third, therefore, Torrance and Gilkey are constructive thinkers who continue to hold that science is a valuable enterprise in the postmodern era. On the one hand, they propose models for the use of science in theology which seem to involve significant reconstruction of traditional interpretations of Christology, Bibliology, and Natural Theology. This is influenced and normed by science. On the other hand, they construct models for the use of science in theology grounded in Christ and nature.

Torrance's model for the use of science in theology is grounded in Christ (as the primordial object of theology) who was interpreted scientifically by the early Church. This interpretation then gave rise to Scripture. However, Christ is also known as He is apprehended through scientific interpretation of Scripture in the Church in every period.

In contrast, Gilkey's model for the use of science in theology is grounded in General Revelation in nature as the primordial object of theology which when interpreted by

Christians in light of ancient natural philosophy (premodern science) gave rise to Scripture. However, the revelation in nature is also known as it is apprehended and interpreted in terms of science in various periods of history and in terms of the language of a specific tradition such as the language of Scripture.[1]

In this respect, Torrance's and Gilkey's models are similar to postmodern models which emphasize the community-specific frameworks that inevitably control the perception or interpretation of reality and hence the use of science in theology.[2] The importance of community-specific frameworks is evident in the emphasis placed on the production of Scripture interpretations by pre-biblical communities and the interpretation and re-interpretation of Scripture in post-biblical communities.

The key issue to note here is the indispensable biblical link between pre-biblical and post-biblical communities of faith implied in the previous paragraph. Torrance's and Gilkey's deconstructions of post-biblical traditions of biblical interpretation highlight the primacy of the biblical perspective on Christ and nature in the

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[1]See Walsh, 273-274.

[2]Brian Walsh sees inconsistency between Gilkey's rejection of the religious vision of fundamentalism and his postmodern defense of a plurality of particular religions visions (274).

construction of models for the use of science. Nevertheless, their revision of Scripture may indicate that they may be tending toward the contemporary emphasis on apprehension of Christ and nature within Church communities as a primary ground and norm for such models. This raises the question of whether these contemporary emphasises are compatible with faithfulness to the indispensable biblical perspective on Christ and nature.[1] In the next section, the key issue of the biblical perspective as a guide to a more comprehensive revelational model is presented.

Toward a Biblical Perspective on Christ and Nature

In Torrance's and Gilkey's models for the use of science in theology there seems to be a tension between the influence of Scripture and the influence of science on

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[1]Brian D. Ingraffia denies the possibility of a postmodern biblical theology. "Most work on Postmodernism and theology to date seeks a reconciliation between these two discourses, a postmodern theology of some sort (even if this be an 'a/theology'). In Western intellectual thought, this unavoidably means some sort of secularized, 'demythologized' or 'radical' Christianity. I [Ingraffia] seek to deny the possibility of such a synthesis, to set up an either/or between postmodern thought and biblical theology." *Postmodern Theory and Biblical Theology: Vanquishing God's Shadow* (Cambridge, UK: Cambridge University Press, 1995), 14. Ingraffia's comments raise the question of whether a premodern or modern synthesis is better than a postmodern synthesis. It also raises the question of whether any synthesis should be sought. This dissertation seeks to explore the possibility of a biblical model which is responsive to the postmodern shift.

Christology and Natural Theology. On the one hand, both Torrance and Gilkey seek to keep theology closely connected to Scripture as a standard for what is authentic Christian theology. This is evident in Gilkey's close interrelation of the use of science in Natural Theology Prolegomena with the use of Scripture symbols in Positive Theology. Similarly, Torrance links use of science in Natural Theology with Scripture interpretation within Positive Theology. The concern for Scripture as norm is also evident in the contrapuntal relationship between Scripture and Christ and between Scripture and nature in Torrance's and Gilkey's models respectively.

On the other hand, however, the contrapuntal methods of Torrance and Gilkey ultimately give control over their models to the influence of science on their Christology and Natural Theology respectively. First, this is evident in their willingness to revise Scripture interpretations as well as Scripture itself in light of their Christology and Natural Theology.[1] Second, Torrance and Gilkey model the

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[1]Torrance and Gilkey may have concluded from the ontological dynamism of Scripture (for example, the formation of the cannon in the past and ongoing textual criticism) that the revision of Scripture in light of interpretations of Christ is a legitimate part of theological method. This raises the question of how one avoids demonic/misunderstood encounters with God that misdirect Scripture interpretation.

uses of science as controlled by Christology and Natural Theology respectively.

Torrance and Gilkey presuppose a Judeo-Christian framework for theology. Thus they accept the comprehensive divine revelation in Christ, Scripture, and nature.[1] However, there seems to be a danger of a compromise of the indispensable Scripture perspective on Christ and nature.[2] As such they seem to fall short of a fully biblical model for the use of science in theology. The next section of this chapter explores how their seeming compromise of the Scripture perspective is related to the nature of their dialogical and dialectical models for the use of science in theology.

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[1]See discussions in chapters 2 and 3 on "The Nature of Theology." These sections are divided by subheadings on Christology, Bibliology, and Natural Theology. Sue Patterson refers to "a revealed model in which God is the source of all human 'schemes of description' within which such propositions as 'objectivity' and 'correspondence' have their play" (Patterson, 27). See Torrance's *Theology in Reconstruction,* 177-178. Any reluctance to make use of emphases on Christ and nature reflects the influence of modern reductionism which both Torrance and Gilkey overtly reject. It is absurd to seek to reduce Christian theology to Christology, to Natural Theology, or to Bibliology.

[2]See the discussion in the section above on "Responsiveness to Postmodern Deconstruction/Construction."

Toward a Biblical Critique of Dialogue and Dialectic

In this section the essence of Torrance's and Gilkey's dialogical and dialectical models is summarized. Then the control of science over both models is clarified. Finally, the need for evaluation of their models from a biblical perspective is highlighted.

First, both the dialogical and the dialectical models attempt to define the limits and the extent of the use of science in theology. On the one hand, the dialogical model proposes that general or formal scientific method is to be used in theology in a way that is suitable to the object of theology. (With regard to Bible study, this results in the transformation of the historical-critical method into a historical-theological method). Therefore, the dialogical use of science in theology involves a dialogue between sciences (theological science and other sciences).

On the other hand, the dialectical model proposes that the theories or "facts" of the sciences are to be used in theology as objects of theological (non-scientific) reflection. (With regard to Bible study this involved the use of the "scientific" historical-critical method.) Therefore, the dialectical use of science in theology involves a dialectic or correlation of theology with all the factual conclusions of other sciences.

The control of science over dialogical and dialectical models is implied in a circular relation between these models of the use of science in theology and the use of *science* in constructing these models. As noted in the previous section, both models seek to keep theology closely connected to Scripture as a standard for what is authentic Christian theology. However, they ultimately give the control over their models to their dialogical Christology and dialectical Natural Theology respectively. Moreover, their respective Christology and Natural Theology are influenced by their use of science. Therefore, it seems that their models for the use of science in theology may be ultimately controlled by science.

Second, issues arising from this apparent control by science may be described in three points. First, on the one hand, the influence/control of science seems to impact Torrance's dialogical model through his normative use of particular traditions of Christian doctrine which have been influenced by what he considers authentic conceptions of science.[1] On the other hand, the influence/control of science seems to impact Gilkey's dialectical model through his normative use of the current conclusions of the factual sciences. This raises the issue of the extent to which

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[1]See the section on "The History of the Use of Science in Theology" in chapter 2.

particular science-influenced traditions of Scripture interpretation and the "assured results" of contemporary science are legitimate norms for the use of science in theology.

Second, the specific dialogical and dialectical uses of science in theology proposed by Torrance and Gilkey may be useful in the interpretation of Christ, Scripture, and nature. However, such uses and interpretations will need some norm or standard by which to be evaluated. On the one hand, the objects being interpreted (Christ, Scripture, Nature) may in principle be a means of evaluating the value of the various uses of science. On the other hand, if Christ, Scripture, and nature are interpreted under the authority of science, then science provides theology with its model for the use of science. The extent to which Torrance and Gilkey allow for this is discussed next.

Third, in spite of the apparently different shapes of Torrance's and Gilkey's models, there is extensive harmony among their specific proposals[1] of uses of scientific method and theory in theology. Note the following points.

1. There is disagreement between Torrance and Gilkey regarding the dialogical and dialectical use of science in Natural Theology Prolegomena and in Positive Theology

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[1]See section on "Dialogical and Dialectical Uses of Science in Theology" in chapter 4.

respectively. However, it seems that major elements of their models are subject to combination through a linking of Theological Prolegomena and Positive Theology.

2. On the semantic level there seems to be a disagreement between Torrance's and Gilkey's models regarding the value of the use of scientific method in theology. Torrance accepts it whereas Gilkey rejects it. In addition, on the semantic level Torrance's model seems to limit the use of scientific "facts" while Gilkey's model seems to use them freely.

Nevertheless, there is extensive compatibility and even overlap between many of their dialogical and dialectic proposals for the use of scientific method and theory. Science seems to be a major influence on their models since despite the different contours of their models they have largely similar views on the specific uses of science in theology. Clearly their Christology and Natural Theology allow for similar uses of science. The Christological and cosmological nature of their models does not provide very different results in terms of the use of science. This may be viewed as a positive thing if one's primary aim is to be faithful to the normative standards of science. However, if one's aim is to be faithful to the Scripture perspective, the uses of science may be evaluated from that perspective.

Third, unfortunately, a biblical evaluation of Torrance's and Gilkey's models is beyond the scope of this dissertation. However, a way forward toward a biblical model for the use of science seems indicated by this study. As evaluated in chapter 4, Torrance's and Gilkey's models have been found to make significant contributions to the issue of the use of science in theology. However, their dialogical and dialectical models are to a significant degree incompatible because of the differences between their positive theologies.[1]

Nevertheless, both theologians regard their models as faithful to the biblical perspective. This leads to questions about whether their models are sufficiently biblical. Could a biblical model be proposed which can be used to go beyond the significant contributions made by Torrance and Gilkey on the dialogical and dialectical use of science in theology? Could such a biblical model be complementary in that it deals adequately with issues raised in dialogical as well as dialectical models? The possible contours of such a biblical model for the use of science in theology will be presented below.

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[1]See summary and conclusion of chapter 4.

Toward a Possible Alternative Model for the Use of Science in Theology

In the three previous sections of this chapter, the need for a more biblical model than those of Torrance and Gilkey was presented. The sections above addressed the need for (1) a more adequate response to postmodern shift, (2) a more comprehensively revelational model, and (3) a biblical evaluation of the dialogical and dialectical models.

The possible contours of such a biblical model for the use of science in theology may be clarified by considering the relations of Christ and nature in biblical perspective. Such a biblical model could be used to transcend the contributions of Torrance's and Gilkey's models.

Sola Scriptura, Unique Primacies, and the Wheel of Theology

A model for the use of science in theology may be built on the *sola Scriptura*[1] principle of the unique primacy of Scripture as a final/ultimate norm for the interpretation of

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[1]On the implications for the sola Scriptura principle see Sidney Greidanus, *"Sola Scriptura": Problems and Principles in Preaching Historical Texts* (Toronto: Wedge Publishing Foundation, 1970); Anthony N. S. Lane, "Sola Scriptura? Making Sense of a Post-Reformation Slogan," in *A Pathway into the Holy Scripture,* ed., P.E. Satterthwaite and D. F. Wright (Grand Rapids, MI: Eerdmans, 1994), 297-327; Ted Peters, "Sola Scriptura and the Second Naivete," *Dialogue* 16 (Fall 1977): 268-280; Paul Gifford, "The Sola Scriptura Ideal: The Almost Normative Status of a Purely Contingent Theological Tradition," *Journal of Theology for South Africa* 57 (1986): 43-56.

Christ and nature. Such a model is based on the biblical interpretations of Christ and nature rather than on a scientific Christology or a Natural Theology based on the facts of science.

Such a *sola Scriptura* model may be seen to be comprehensively revelational when it is illustrated as a bicycle wheel with Scripture as the spokes, Christ as the hub, and nature as the rim or outer circle. As such, Scripture provides the framework of a theology in which Christ is the center and nature is the context. This model for the use of science in theology is biblically structured, Christocentric, and cosmically contextualized.

There are two important advantages to this model. First, it seems to provide an uncompromisingly biblical (sola Scriptura) structure in that it is defined based on the perspective of the special revelation in Scripture with regard to the supreme revelation in Christ, and the general revelation in nature.[1] Second, this model seems able to incorporate some of the strengths of Torrance's and Gilkey's models with regard to various uses of science as a resource

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[1]Such a model has been suggested in Martin Hanna's articles: "Science and Theology," "The Pre-Advent Explosion of Knowledge," "The Servant-Master Roles of the Laws of Christ, Scripture and Nature," "The Divine-Human Christ," and "The Harmonious Development of Faith and Learning." See chapter 1 for full references.

for theology. These two advantages are further explored below.

On the one hand, Scripture revelation is the unique source (*sola Scriptura*) for the framework of this model. In light of this framework, Christ, Scripture, and nature are interpreted from a biblical perspective. As a result, Christ, Scripture, and nature are understood in terms of biblically interpreted unique primacies instead of in terms of a single primacy of one over the other.[1] This means that Christ is uniquely primary as the center of biblical theology while nature is uniquely primary as the context for biblical theology.[2] However, since these unique primacies are derived from Scripture they do not compromise the *sola Scriptura* principle. In this proposed model, only Scripture revelation is of the special character that can provide an

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[1]See Hanna, "Pre-Advent Explosion of Knowledge." It may be argued that the single primacy of Christology or Natural Theology respectively has determined the shape of Torrance's and Gilkey's models.

[2]Context is used here in terms of the biblical truth that theology is cosmic in its scope. No control of the interpretation of Scripture by an extrabiblical context is implied. On the contrary, the cosmic context of biblical theology is defined by Scripture interpreted within the context of Scripture according to the sola Scriptura principle (Scripture interprets Scripture).

interpretative framework for theology. This is what makes Scripture uniquely primary.[1]

On the other hand, not only is this model for the use of science uncompromisingly biblical, it is also open to the use of science as a resource for theology. As such it accepts the aims of Torrance's and Gilkey's models with regard to clarifying the use of science in theology. However, it differs from their models with regard to the norm or standard for determining the nature of the use of science in theology. This may be explored further by showing how Torrance and Gilkey might respond to such an uncompromisingly biblical model.

Possible Criticisms From Torrance and Gilkey

I expect that Torrance and Gilkey would perceive this study of their models in the positive light intended by this researcher. However, there are at least five criticisms they might raise to a sola Scriptura model for the use of science in theology. First, Gilkey might respond to this model as an example of narrow pre-modern and pre-critical

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[1]Here the *prima Scriptura* principle is not an alternative to the *sola Scriptura* principle as in the Roman Catholic model. Rather, *prima Scriptura* is derived from the *sola Scriptura* principle. Scripture is the only primary or final rule for constructing models for the use of science in theology.

creationism. He might criticize the model for what might seem to be a lack of respect for the methods and theories of the non-theological Sciences. This might appear to him to be the result of lack of awareness of modern and postmodern shifts in philosophy of science and philosophical theology. However, I agree with Gilkey that no informed person in this postmodern era can be authentically pre-critical.[1] In addition, this dissertation demonstrates that one can be informed concerning the premodern, modern, and postmodern shifts and at the same time find intellectual and spiritual value in a biblical (yet comprehensively revelational) model which interprets the revelations of Christ and nature from a biblical perspective. Also, the postmodern era allows for respectful dialogue, dialectic, and/or complementarity among different perspectives (including the biblical perspective). It also allows for a new respect for some pre-critical values.

Second, Torrance might respond to the model presented in this chapter as lacking sufficient attention to the scientific norm for the use of science in theology. For him, the Christological dimension of Theological Science is the key to scientific objectivity. Therefore, he might be critical of the model presented here because of its specific

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[1]See section on "The History of the Use of Science in Theology" in chapter 3.

emphasis on Scripture as the source of the framework for a model for the use of science in theology. This may appear to him as an unscientific biblicism which rejects Christ as the true object of scientific theology. However, Torrance himself qualifies his Christocentricism when he defines theology as the study of God in Christ in the Church's interpretation of Scripture in the world. This chapter has proposed an alterative to his hierarchy of Christ over Scripture over nature. This alternative involves the concept of the unique primacies of Christ and nature according to the *sola Scriptura* principle discussed above.

In brief, Torrance and Gilkey may respond that this model is not sufficiently responsive to the postmodern shift. In addition, from Torrance's perspective the model proposed here may not be sufficiently Christological and dialogical. Finally, from Gilkey's perspective, it may not be sufficiently Cosmological and dialectical. However, from the perspective of the biblical model proposed here, their models may not be sufficiently biblical. As such, their models (1) do not provide a throughly biblical response to the postmodern shift, (2) do not adequately reflect the comprehensively revelational nature of the biblical perspective, and (3) do not provide a sufficiently biblical

basis for evaluating the complementarity of dialogical and dialectical models.[1]

Third, both Torrance and Gilkey might respond with the objection that the grounding of a model on Scripture inevitably involves some interpretation of the Scripture framework which is not more privileged than their Scripture-related interpretations of Christ and nature. However, the proposal presented here follows the epistemological order of the human apprehension of revelation through revealed Scripture interpretations of other revelations. In contrast, Torrance's and Gilkey's models seek to follow the order of scientific understanding of revelation in Christ or nature respectively as the key for the interpretation of Scripture revelation.

Fourth, Torrance and Gilkey might respond that this *sola Scriptura* model does not provide a basis for revising inadequate biblical perspectives. As a result such a model might appear outdated in light of current science and

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[1]There is no need in this model to accept the conclusions of science uncritically as Gilkey seems to do when he revises Scripture in the light of science. Similarly, there is also no need in this model to revise Scripture in light of scientific apprehension of Christ as does Torrance. This does not imply that this model rejects the use of methods/theories of science or the illumination which comes from the Christian experience of Christ or nature. What is needed is not an emphasis on what may be wrong with their proposals. Rather attention should be given to the possible complementarity between valid elements of their models.

current claims of direct apprehensions of revelation in Christ and nature. However, it is important to distinguish interpretations of extra-biblical revelations from the biblical framework that norms these interpretations. The biblical model proposed here does not imply static views of Christ, nature, and science. Rather, in this model, interpretations are open to revision in response to ongoing study of the revelational source (Scripture) which guides the interpretation of Christ, nature, and science. However, Scripture itself is not revised in light of extra-biblical apprehensions of Christ and nature. This is because, in a *sola Scriptura* model, Scripture is regarded as having ontological and epistemological status as revelation. In such a model the interpretation of Christ and nature does not lead to the erosion or revision of biblical revelation.

Fifth, Torrance and Gilkey might respond that a sola Scriptura model is too simplistic in light of the complex issue of the use of science in theology. However, this dissertation does not presume that the question of a biblical model for the use of science in theology can be easily answered. Only some possible contours for such a model are suggested here. Clarifying a biblical model for the use of science is complicated by the fact that very different models (like those of Torrance and Gilkey) have

claimed to be biblical. Finally, there are not enough persons involved in biblical study who are attempting to clarify what the biblical framework might be for a model for the use of science in theology.[1]

In this section a biblical model for the use of science in theology has been described in a preliminary way. This model is more comprehensively revelational than one which simply combines the Christological and cosmological models of Torrance and Gilkey. However, it is not necessarily incompatible with some dialogical and dialectical insights highlighted by Torrance and Gilkey. In the final section of this chapter these and other related areas where further research is needed will be surveyed.

Further Research Needed

Further research is needed in a number of areas which are related to the use of science in theology as studied in this dissertation. Some of these were mentioned in the section on delimitations in chapter 1.

First, with regard to the historical background to the problem of models for the use of science in theology, much work remains to be done especially with regard to the transition to a postmodern period which this dissertation has only introduced. Second, the presence of constructive

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[1]See section below on "Further Research Needed."

as well as deconstructive strands in postmodern thought needs further clarification. Overlooking of this fact has led to the uncritical rejection of any perspective that describes itself as postmodern or as making use of aspects of postmodern thought. Actually, many contemporary theologians and scientists are responsive to postmodern thought to one degree or another whether or not they realize this fact. Third, many other models for the use of science in theology have been proposed and are worthy of in-depth analysis such as has been done here with regard to the models of Torrance and Gilkey.[1] Fourth, much work remains to be done to clarify the sola Scripture model for a use of science in theology based on the unique primacy of Scripture (as source of theology) and the unique primacies of Christ and Nature (as center and context for theology).

In this postmodern era all foundations for the use of science in theology are being questioned. Alternative postmodern "frameworks" are being proposed. In light of this situation, the issues addressed in this dissertation have led to one basic issue. Can Judeo-Christian Scripture provide the framework for a model for the use of scientific method and/or scientific theory ("fact") in theology?

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[1]See chapter 1. Also, in spite of the many studies done on Torrance and Gilkey, other elements of their theologies deserve to be explored further.

It is to the work of clarifying such a biblical model that my theological research career is committed. However, there is room in this important task for many other researchers to participate in the delineation of the contours of a biblical model. This dissertation suggests that a biblical model may be comprehensively revelational through an emphasis on the unique primacy of Judeo-Christian Scripture as the foundation for a framework for the unique primacies of Christ and nature. In addition, a biblical model may be responsive to postmodernism and may propose a complementarity of science (as the study of nature) and theology (as the study of the Creator).

BIBLIOGRAPHY

Primary Resources

Langdon B. Gilkey

The citations in this part of the bibliography are arranged chronologically from the earliest to the most recent.

"Academic Freedom and the Christian Faith." *Christianity and Crisis* 12, no. 22 (1952): 171-173.

"Christian Response to the World Crisis." *Christianity and Crisis* 15, no. 14 (1955): 107-111.

"Biblical Theology and Historical Reality" [Review Article]. *Encounter* 19 (1958): 214-218.

"The Imperative for Unity--A Re-Statement." In *Issues in Unity,* 11-32. Indianapolis: Council on Christian Unity, 1958.

"Neo-Orthodoxy." In *A Handbook of Christian Theology: Definition Essays on Concepts and Movements of Thought in Contemporary Protestantism,* 256-261. New York: World Publishing Co., 1958.

Maker of Heaven and Earth: A Study of the Christian Doctrine of Creation. New York: Doubleday, 1959.

"Darwin and Christian Thought: Why They Need Not Conflict." *Christian Century* 77 (1960): 7-11.

"Cosmology, Ontology, and the Travail of Biblical Language." *The Journal of Religion* 41, no. 3 (July 1961): 194-205.

"A History of Christian Ideas. Speculation and Revelation in the Age of Christian Philosophy, by R Kroner, 1959." *Christian Scholar* 44 (1961): 169-172.

"The Concept of Providence in Contemporary Theology," *The Journal of Religion* 73 (1963): 171-172.

"The Secular Meaning of the Gospel, by P M Van Buren, 1963" [Review Article]. *Journal of Religion* 44 (1964): 238-243.

"Secularism's Impact on Contemporary Theology." *Christianity and Crisis* 25 (1965): 64-67.

"Dissolution and Reconstruction in Theology [How I Am Making up My Mind]." *Christian Century* 82 (1965): 135-139.

Shantung Compound: The Story of Men and Women Under Pressure. New York: Harper and Row, 1966.

"The Authority of the Bible: The Relation of the Bible to the Church." *Encounter* 27, no. 2 (Spring 1966): 112-123.

"Evolutionary Science and the Dilemma of Freedom and Determinism." *Christian Century* 84 (1967): 339-343.

"Secularism's Impact on Contemporary Theology." In *Radical Theology: Phase Two, Essays in a Continuing Discussion*, ed. C. W. Christian and Glenn R. Wittig. Philadelphia: J. B. Lippincott, 1967.

"Theology." In *The Great Ideas Today 1967*, ed. William Benton, 238-270. Chicago: Encyclopedia Britannica, 1967.

"Modern Myth-Making and the Possibilities of Twentieth-Century Theology." In *Renewal of Religious Thought, Proceedings of the Congress on the Theology of Renewal of the Church Centenary of Canada, 1867-1967*, ed. L. K. Shook, 283-312. New York: Herder and Herder, 1968.

Naming the Whirlwind: The Renewal of God-Language. Indianapolis: Bobbs-Merrill Company, 1969.

"New Modes of Empirical Theology." In *The Future of Empirical Theology*, ed. Bernard Meland, 345-370. Chicago: University of Chicago Press, 1969.

"Religion and the Secular University." *Dialog* 8 (1969): 108-116.

"Trends in Protestant Apologetics." In *The Development of Fundamental Theology, Concilium*, vol. 46, ed. Johannes B. Metz. New York: Paulist Press, 1969.

Religion and the Scientific Future: Reflections on Myth, Science, and Theology. Everston, NY: Harper and Row, 1970.

"Theology in the Seventies." *Theology Today* 27 (1970): 292-301.

"Religious Dimensions of Scientific Inquiry." *Journal of Religion* 50 (1970): 245-267.

"Ervaring en interpretatie van de religieuze dimensie: een reaktie." *Tijdschrift voor Theologie* 11, no. 3 [1971]: 293-302.

"Empirical Science and Theological Knowing." In *Foundations of Theology: Papers from the International Lonergan Congress,* 1970, ed. Philip McShane, 76-101. Dublin, Iraland: Gill and MacMillan, 1971.

"Biblical Symbols in a Scientific Culture." In *Science and Human Values in the Twenty-first Century,* ed. Ralph Wendell Burhoe. Philadelphia: Westminster Press, 1971.

"Pannenberg's Basic Questions in Theology: A Review Article." *Perspective* 14 (1973): 34-55.

"Symbols, Meaning, and the Divine Presence." *Theological Studies* 35, no. 2 (June 1974): 249-267.

"Reinhold Niebuhr's Theology of History." *The Journal of Religion* 54, no. 4 (October 1974): 360-386.

"Religion and the Technological Future." *Criterion* 13 (1974): 9-14.

"Christian Theology." *Criterion* 13 (1974): 10-13.

"The Spirit and the Discovery of the Truth through Dialogue." In *Experience of the Spirit,* ed. Peter Huizing and William Bassett, 58-68. New York: Seabury Press, 1974.

Catholicism Confronts Modernity: A Protestant View. New York: Seabury Press, 1975.

"The Structure of Academic Revolutions." In *The Nature of Scientific Discovery*, ed. Owen Gingerich. Washington, DC: Smithsonian Institution Press, 1975.

Reaping the Whirlwind: A Christian Interpretation of History. New York: Seabury Press, 1976.

"Theology and the Future." *Andover Newton Quarterly* 17 (1977): 250-257.

"Responses to Peter Berger." *Theological Studies* 39 (1978): 486-497.

"Namer and Tamer of the Whirlwind: An Interview by Kendig Brubaker Cully." *New Review of Books and Religion* 2 (1978): 3.

Message and Existence: An Introduction to Christian Theology. New York: Seabury Press, 1979.

"The AAR and the Anxiety of Nonbeing: An Analysis of Our Present Cultural Situation" [Annual Meeting, 1979: Presidential Address]. *Journal of the American Academy of Religion* 48 (1980): 5-18.

"Theology for a Time of Troubles: How My Mind Has Changed." *Christian Century* 98 (1981): 474-480.

"The New Watershed in Theology." *Soundings* 64 (1981): 118-131.

"Is Religious Faith Possible in an Age of Science?" *Journal of the American Academy of Religion Thematic Studies* 48, no. 1 (1981): 31-44.

"Creationism: The Roots of the Conflict." *Christianity and Crisis* 42 (1982): 108-115.

Society and the Sacred. New York: Crossroad, 1982.

"The Dialectic of Christian Belief." In *Society and the Sacred,* 26-39. New York: Crossroad, 1982.

Creationism on Trial: Evolution and God at Little Rock. San Francisco: Harper and Row, 1985.

"Theology as the Interpretation of Faith for Church and World." In *The Vocation of the Theologian,* ed. Theodore Jennings, 87-103. Minneapolis: Fortress Press, 1985.

"The Present Situation Within Which Theology Is Done." In *Exploring Christian Theology,* ed. Ronnie Littlejohn, 8-25. Landham, MD: University Press of America, 1985.

"The Role of the Theologian in Contemporary Culture." In *The Thought of Paul Tillich,* ed. James Luther Adams, Wilhelm Pauck, and Roger Lincoln Shinn. San Fransisco: Harper and Row, 1985.

"Events, Meanings and the Current Tasks of Theology" [American Academy of Religion, 75th, 1984, Chicago]. *Journal of the American Academy of Religion* 53, no. 4 (1985): 717-734.

"Dimensions of Basic Faith and the Special Traditions." *Second Opinion* 2 (1986): 107-119.

"An Appreciation of Karl Barth." In *How Karl Barth Changed My Mind,* ed. Donald K. McKim, 150-155. Grand Rapids, MI: Eerdmans, 1986.

"The Symbol of God" [Paul Tillich]. *Soundings* 69 (1986): 384-400.

"Religion and Science in an Advanced Scientific Culture." *Zygon* 22 (1987): 165-178.

"Introduction: A Retrospective Glance at My Work." In *The Whirlwind in Culture: Frontiers in Theology,* ed. Donald W. Musser and Joseph L. Price, 1-35. Bloomington, IN: Meyer-Stone Books, 1988.

"The Principle of Order in the West." Paper presented at Confucian-Christian Conference, Hong Kong, June 1988.

"Nature, Reality and the Sacred." *Zygon* 24 (September 1989): 283-95.

"Theology and Culture: Reflections on the Conference." *Criterion* 28 (1989): 2-9.

"Nature, Religion and the Sacred." Paper presented at the Midwest American Theological Society, 1989.

Gilkey on Tillich. New York: Crossroad, 1990.

"Creation, Being and Nonbeing." In *God and Creation: An Ecumenical Symposium*, ed. David B. Burrell and Bernard McGinn, 226-241. Notre Dame, IN: University of Notre Dame Press, 1990.

"Whatever Happened to Immanuel Kant?" In *The Church and Contemporary Cosmology: Proceedings of a Consultation of the Presbyterian Church (U.S.A.)*, ed. James B. Miller and Kenneth E. McCall. Pittsburgh: Carnegie Mellon University Press, 1990.

"Cosmos, Conscience, and Creation." Paper presented at the National Association for Science, Technology and Society, 1990.

"The Human Care of Creation." Paper presented at the Conference on Ecology, 1990.

"What Does Science Have to Learn from Religion?" Paper presented to the American Association for the Advancement of Science, 1990.

"What of Value Does Religion Have to Say to Science?" [Scientific Methodology]. *Center for Theology and Natural Sciences Bulletin* 10 (1990): 6-9.

"Caring for Creation." Paper presented at the North American Conference on Religion and Ecology, 1990.

"Can We Speak of God in Our Day?" Paper presented at Saint Catherine's School, 1990.

"The Human Care of Nature" and "The God of Nature." Papers presented at Hardin-Simmons University, 1991.

"Human Viability in a Nature That Is Mortal." Paper presented at the Templeton Conference, 1991.

"Plurality: Christianity's New Situation." In *Through the Tempest: Theological Voyages in a Pluralistic Culture*, ed. Jeff B. Pool, 21-34. Minneapolis: Fortress Press, 1991.

Through the Tempest: Theological Voyages in a Pluralistic Culture. Edited by Jeff B. Pool. Minneapolis: Fortress Press, 1991.

"What Theology Can Learn from Science." In *Science, Technology, and the Christian Faith*, ed. Brent Waters and Vernon L. Barbour. Springfield, MO: United Ministries in Higher Education, 1991.

"Response to Stone's 'The Viability of Religious Naturalism'." *American Journal of Theology and Philosophy* 14, no. 1 (January 1993): 43-48.

Nature, Reality and the Sacred: The Nexus of Science and Religion. Minneapolis: Fortress Press, 1993.

"Review of *A Christian Natural Theology* by John B. Cobb, Jr." In *Theology Today* 22 (1996): 531-534.

Blue Twilight: Nature, Creationism, and American Religion. Minneapolis: Fortress Press, 2001.

On Niebuhr: A Theological Study. Chicago: University of Chicago Press, 2001.

Thomas F. Torrance

The citations in this part of the bibliography are arranged chronologically from the earliest to the most recent.

"The Place and Function of Reason in Christian Theology." *Evangelical Quarterly* 14 (1942): 22-41.

"Review of Emil Brunner's *Revelation and Reason*." *The Record*, November 7, 1947, 681.

"Review of *The New Modernism: An Appraisal of the Theology of Barth and Brunner*," by Cornelius Van Till. *Evangelical Quarterly* 19 (1947): 144-149.

"The Word of God and the Nature of Man." In *Reformation Old and New: Festschrift for Karl Barth*, ed. F. Camfield, 121-141. London: Lutterworth, 1947.

"The New Modernism." *The Evangelical Quarterly* 19 (1947): 144-149.

"Faith and Philosophy." *Hibbert Journal* 45 (1948-1949): 237-246.

"Salvation Is of the Jews." *Evangelical Quarterly* 22 (1950): 165.

Review of *The Prophetic Faith of our Fathers: The Historical Development of Prophetic Interpretation*, by Leroy Edwin Froom. *Scottish Journal of Theology* 6 (1953): 435-436.

"The Modern Eschatological Debate." *Evangelical Quarterly* 25 (1953): 45-54; 94-106; 167-178; 224-232.

Review of *The Inspiration and Authority of the Bible*, by B. B. Warfield. *Scottish Journal of Theology* 7 (1954): 319-320.

"The Place of Christology in Biblical and Dogmatic Theology." In *Essays in Christology for Karl Barth*, ed. T. H. L. Parker, 13-37. London: Lutterworth Press, 1956.

"Karl Barth." *Expository Times* 66 (1956): 205-209.

"The Place of the Humanity of Christ in the Sacramental Life of the Church." *Church Service Society Annual* 26 (1956): 129-134.

"Israel and the Incarnation." *Judaica* 13 (1957): 1-18.

"Karl Barth: In Homage." *High Point College Review of Theology and Philosophy* (April 1960): 5-12.

Karl Barth: An Introduction to His Early Theology, 1910-1931. London: SCM Press, 1962.

"The Foundation of the Church." *Scottish Journal of Theology* 16 (1963): 113-131.

"Barth: Equal to Athanasius?" *The British Weekly*, June 21 1963, 2.

"Die Wahrheit, Wie Sie in Jesus ist." In *Vom Herrengeheimnis der Wahrheit, Festschrift für Heinrich Vogel,* ed. Kurt Scharf, 254-276. Berlin: Lettner Verlag, 1962.

"Scientific Hermeneutics According to St Thomas Aquinas." *Journal of Theological Studies* 13 (1962): 259-289.

"The Influence of Reformed Theology on the Development of Scientific Method." *Dialog* 2 (1963): 40-49.

"Calvin on the Knowledge of God." *The Christian Century* 81, no. 22 (May 27 1965): 696-699.

"Knowledge of God and Speech About Him According to John Calvin." *Revue d'Histoire et de Philosophie Religieuses* 44 (1964): 402-422.

Review of Martin Heidegger's *Being and Time. Journal of Theological Studies* 15, no. 2 (1964): 471-486.

"Theology and Science: Dogmatics, the Key to Church Unity." *The Scotsman,* February 10, 1964, 6.

"Science, Theology and Unity." *Theology Today* 21 (1964): 149-154.

"The Scientific Character of Theological Statements." *Dialog* 4 (1965): 112-117.

Theology in Reconstruction. London: SCM, 1965.

"The Epistemological Relevance of the Holy Spirit." In *Ex Auditu Verbi: Theologische Opsrellen Aangeboden aan Prof. Dr. G. C. Berkhouwer,* ed. R. Schippers et al., 272-296. Kampen: Kok, 1965.

"The Eclipse of God." *Baptist Quarterly* 22 (1967): 194-214.

"Hermeneutics According to Schleiermacher." *Scottish Journal of Theology* 21 (1968): 257-267.

"Intuitive and Abstractive Knowledge from Duns Scotus to John Calvin." In *De doctrina Ioannis Duns Scoti. Acta tertii Congressus Scotistici Internationalis. Studia Scholastico-Scotistica,* 5:291-305. Rome: Societas Internationalis Scotistica, 1968.

Space, Time and Incarnation. London: Oxford University Press, 1969.

"Ecumenism and Science." In *Oecumenica. Jahrbuch für ökemenische Forschung,* ed. F. W. Kamtzenbach et al., 321-338. Minneapolis: Augsburg Publishing House, 1969.

"Karl Barth." *Scottish Journal of Theology* 22 (1969): 1-9.

"Spiritus Creator." *Verbum Caro* 23 (1969): 63-85.

"The Word of God and the Response of Man." *Bijdragen* 30 (1969): 172-183.

"Theological Rationality." In *Ecclesia a Spiritu Samcto edocta, Lumen Gentium, Mélanges théologiques: Hommage à Mgr. G. Philips,* ed. E. Descamps, 455-473. Duculot: Gembloux, 1970.

"The Problem of Natural Theology in the Thought of Karl Barth." *Religious Studies* 6 (1970): 121-135.

The Relevance of Orthodoxy. Stirling: Drummond Press, 1970.

Foreword to *"Secular Christianity" and God Who Acts,* by Robert J. Blaike. London: Hodder and Stoughton, 1970.

"Karl Barth." In *Ten Makers of Modern Protestant Thought,* ed. G. L. Hunt. Rev. ed. New York: Association Press, 1971.

"Ecumenism and Science." In *God and Rationality,* 112-134. New York: Oxford University Press, 1971.

God and Rationality. London: Oxford University Press, 1971.

"The Place of Word and Truth in Theological Inquiry According to St Anslem." In *Studia medievalia et mariologica, P. Carolo Balic' OFM septuagesimum explenti annum dicata,* ed. R. Zavalloni, 131-160. Rome: Editrice Antonianum, 1971.

"Incarnation: Myth or Reality." *Scottish Church Society Report* (1972-1980): 12.

"Newton, Einstein and Scientific Theology." *Religious Studies* 8 (1972): 233-250.

"Truth and Authority: Theses on Truth." *Irish Theological Quarterly* 39, no. 3 (July 1972): 213-242.

Review of *Falsification and Belief,* by Alastair McKinnon. *Scottish Journal of Theology* 25 (1972): 435-457.

"The Integration of Form in Natural and Theological Science." *Science, Medicine and Man* 1 (1973): 143-172.

"The Relation of the Incarnation to Space in Nicene Theology." In *The Ecumenical World of Orthodox Civilization. III. Russia and Orthodoxy. Essays in Honor of Georges Florovsky,* ed. Andrew Blane, 43-70. Mouton: The Hague, 1973.

"Science and Philosophy in the Era of Cosmological Revolution." *Abba Salama* 5 (1974): 165-168.

"The Contribution of the Greek Community in Alexandria to the Intelligent Understanding of the Christian Gospel and Its Communication in the World of Science and Culture." *Abba Salama* 5 (1974): 188-192.

Theology in Reconciliation: Essays Towards Evangelical and Catholic Unity in East and West. London: Geoffrey Chapman, 1975.

"The Function of Inner and Outer Word in Lonergan's Theological Method." In *Looking at Lonergan's Method,* ed. Patrick Cocoran, 101-126. Dublin: Talbot Press, 1975.

"Hermeneutics, or the Interpretation of Biblical and Theological Statements, According to Hilary of Poitiers." *Abba Salama* 6 (1975): 37-69.

The Centrality of Christ. Devotions and Addresses: General Assembly of the Church of Scotland, 1976. Edinburgh: Saint Andrew Press, 1976.

"The First-Born of All Creation." *Life and Work,* December 1976, 12-14.

Space, Time and Resurrection. Edinburgh: Handsel Press, 1976.

"Christian Theology in the Context of Scientific Revolution." In *Pluralisme et Oecumenisme en Recherches Théologiques*. Mélanges offerts au R. P. Dockx, O. P., ed. Y. Congar et al., 295-311. *Bibliotheca Ephemeridum Theologicarum Lovaniensium*, 43, Paris-Gembloux: Éditions Duculot, 1976.

"The Whole Universe Revolves Around Christ." *Life and Work*, April 1977, 12-14.

"The Pre-eminence of Christ." Sermon to the General Assembly of the Church of Scotland before H. M. the Queen. *Expository Times* 89, no. 2 (1977): 54-55.

"Determination and Free Creation According to the Theologians." In *Communications of the New York Symposium*. July 1977, *Institut International des Sciences Théoriques*, Bruxelles, reprint from *Abba Salama* 9 (1978).

Israel: People of God--God, Destiny and Suffering. London: Council of Christians and Jews, 1978.

"Man the Priest of Creation." Address on Receiving the Templeton Prize, *The Templeton Prize 1978*. Dublin: Lismore Press, 1978.

Theological Science. London: Oxford University Press, 1969.

"God and the Contingent World." *Zygon* 14, no. 4 (December 1979): 329-348.

"The Open Universe and the Free Society." *Ethics in Science and Medicine* 6, no. 3 (November 1979): 145-153.

"We Have Broken Free from a Closed Universe" [Interview with Brian Cooper]. *The British Weekly and Christian World*, September 21, 1979, 7.

"The Place of Michael Polanyi in the Modern Philosophy of Science." *Ethics in Science and Medicine* 7 (1980): 57-95.

The Ground and Grammar of Theology. Charlottesville: University Press of Virginia, 1980.

"Incarnation: Myth or Reality." *Scottish Church Society Report* (1972-1980): 12.

"Ultimate Beliefs and the Scientific Revolution." *Cross Currents* 30, no. 2 (Summer 1980): 129-149.

"God and the Contingent World." *Epistemologia* 3 Special Issue (1980): 161-194.

"A New Vision of Wholeness" [Interview with Mary Doyle Morgan]. *Presbyterian Survey,* December 1980, 21-23.

Christ's Words [An Address given for The Order of Christian Unity]. Jedburgh: Unity Press, 1980.

"The Mediation of Christ in Our Human Response to God." Class discussion, 6 July 1981.

Christian Theology and Scientific Culture. Vol. 1 of *Theology and Scientific Culture,* ed. T. F. Torrance. New York: Oxford University Press, 1981.

The Incarnation: Ecumenical Studies in the Nicene-Constantinopolitan Creed A.D. 381. Edinburgh: Handsel Press, 1981.

Divine and Contingent Order. New York: Oxford University Press, 1981.

"Croyances Fondamentales et Revolution Scientifique." *Revue d'Histoire et de Philosophie Religieuses,* 61e année, 1 (January-March 1981): 43-66.

Contribution to Seminar on *Das Problem der Zeit,* ed Paderborn: Reinhard Wegner, 1981. *Informatie-en Bibliotheekwetenschap Publications, Das Deutsches Institut für Bildung und Wissen,* 7-16.

"Divine and Contingent Order." In *The Sciences and Theology in the Twentieth Century,* ed. A. R. Peacocke, 81-97, 302-303. Notre Dame, IN: University of Notre Dame Press, 1981.

Reality and Evangelical Theology. Philadelphia: Westminster, 1982.

"The Divine Vocation and Destiny of Israel in World History." In *The Witness of the Jews to God*, ed. David W. Torrance. Edinburgh: Handsel Press, 1982.

"Transformation in the Frame of Knowledge." *Science and Public Policy* 9 (April 1982): 97-100.

Juridical Law and Physical Law. Toward a Realist Foundation for Human Law. Edinburgh: Scottish Academic Press, 1982.

Das Verhältnis zwischen christlichen Glauben und moderner Naturwissenschaft. Die geistesgeschichtliche Bedeutung von James Clerk Maxwell in *Informatie-en Bibliotheekwetenschap Journal*, Sonderlage zu Heft 2, Februr 1982. Das Deutsche Institut für Bildung und Wissen, Paderborn, 1982.

"Uber die Anderung des wissenschaftlichen Denkrahmens." *Evangelium und Wissenschaft* 7, no. 82 (1982): 13-19.

"Review of Russell Stannard's *Science and Christian Belief.*" *Life and Work*, December 1982, 42.

"Theological Realism." In *The Philosophical Frontiers of Christian Theology: Essays Presented to D. M. MacKinnon*, ed. Brian Hebblewaite and Stewart Sutherland, 169-196. Cambridge: Cambridge University Press, 1982.

"The Deposit of Faith." *Scottish Journal of Theology* 36, no. 1 (1983): 1-28.

The Mediation of Christ. Exeter: Paternoster Press, 1983.

"The Mediation of Revelation." In *The Mediation of Christ*. Grand Rapids, MI: Eerdmans, 1983.

"The Substance of the Faith: A Clarification of the Concept in the Church of Scotland." *Scottish Journal of Theology* 36, no. 3 (1983): 327-338; also published in *The Monthly Record of the Free Church of Scotland* 2 (December 1983): 261-265.

"Concept of Order in Theology and Science." *The Month* 16, no. 12 (December 1983): 410-404.

Transformation and Convergence in the Frame of Knowledge: Explorations in the Interrelations of Scientific and Theological Enterprise. Grand Rapids, MI: Eerdmans, 1984.

"Transformation in the Frame of Knowledge." *In Necessariis Unitas: Mélanges offerts á Jean-Louis Leuba*, ed. Richard Stauffer, 397-484. Paris: Le Cerf, 1984.

"The Life and Work of Professor Thomas F. Torrance" [interview]. *Reformed Review* 38 (1984): 47-64.

"The Three Hierarchs and the Greek Christian Mind." *Texts and Studies* 3 (1984): 87-96.

"Christ's Human Nature" [Letter to Editor]. *The Monthly Record of the Free Church of Scotland* (May 1984): 114.

"The Concept of Order in Theology and Science." *The Princeton Seminary Bulletin*, n.s., 5, no. 2 (1984): 130-139.

"A Pilgrimage in the School of Faith—An Interview With T. F. Torrance, by John I. Hesselink." *Reformed Review* 38, no. 1 (1984): 49-64.

Test-Tube Babies, Morals—Science—and the Law. Edinburgh: Scottish Academic Press, 1984.

"Theologische und Wissenschaftliche Forschung." Translated by Robin Hammond. *Informatie-en Bibliotheekwetenschap Journal* 7 (1985): 3-16.

"Grundlegende Aufgaben in Theologie und Wissenschaft." *Evangelium und Wissenschaft* 13, no. 85 (1985): 36.

"Theological and Scientific Inquiry." *Dedication Addresses: The Center for Theological Inquiry*. Reports, No. 2. Princeton, 1985, 7-21.

Reality and Scientific Theology, Theology and Science at the Frontiers of Knowledge. Vol. 1. Edinburgh: Scottish Academic Press, 1985.

The Christian Frame of Mind. Edinburgh: Handsel Press, 1985.

"God Did IT!" (shortened form of "The Concept of Order"). *Decision,* British Edition, 25, no. 9 (September 1985): 16-17.

"My Interaction With Barth." In *How Karl Barth Changed My Mind,* ed. Donald K. McKim, 52-64. Grand Rapids, MI: Eerdmans, 1986.

"Theological and Scientific Inquiry: Conjoint Research between Theology and Science at Points of their Deepest Convergence." *Journal of the American Scientific Affiliation* 38, no. 1 (March 1986): 2-10.

"Time in Scientific and Historical Research." *Gottes Zukunft—Zukunft der Welt.* Festschrift Für Jürgen Moltmann Zum 60. Geburtstag, Herausgegeben von Hermann Deuser et al., 292-297. Munich: Chr. Kaiser Verlag, 1986.

"Why Karl Barth Still Matters So Much." *Life and Work,* June 1986, 16.

"My Interaction With Karl Barth." In *How Karl Barth Changed My Mind,* ed. Donald K. McKim, 52-64. Grand Rapids, MI: Eerdmans, 1986.

"The Legacy of Karl Barth (1886-1986)." *Scottish Journal of Theology* 39, no. 3 (1986): 289-308.

"Karl Barth: 1886-1986." *Theological Students Fellowship Bulletin* 10, no. 1 (1986): 4-5.

"Karl Barth and the Latin Heresy." *Scottish Journal of Theology* 39, no. 4 (1986): 461-482.

"Answer to Prosch on Polanyi's Convictions About God [Letter to the Editor]." *Tradition and Discovery: The Polanyi Society Periodical* 14, no. 1 (1986-1987): 30.

"The Reconciliation of Mind." *Theological Students Fellowship Bulletin* 10, no. 3 (1987): 4-7.

"The Hermeneutics of John Reuchlin, 1455-1522." In *Church, Word and Spirit. Historical and Theological Essays in Honor of Geoffrey W. Bromiley*, ed. James E. Bradley and Richard A. Muller, 107-121. Grand Rapids, MI: Eerdmans, 1987.

"Realism and Openness in Scientific Inquiry." *Zygon* 23, no. 2 (June 1988): 159-169.

The Trinitarian Faith: The Evangelical Theology of the Ancient Catholic Church. Edinburgh: T & T Clark, 1988.

The Hermeneutics of John Calvin. Monograph Supplements to *Scottish Journal of Theology*, ed. A. I. C. Heron and I. R. Torrance. Edinburgh: Scottish Academic Press, 1988.

"Fundamentale Ergebnisse in Theologie und Wissenschaft." *Informatie-en Bibliotheekwetenschap Journal* 1 (January 1988): 11-21.

"*Phusikos Kai Theologikos Logos*, St Paul and Athenagoras at Athens." *Scottish Journal of Theology* 41, no. 1 (1988): 11-26.

"Early Patristic Interpretation of the Holy Scriptures." *Ekklesia Kai Theologia* 9 (1988); 137-170.

"The Hermeneutics of Clement of Alexandria." *Texts and Studies; A Review for Hellenism in Diaspora* 7 (1988): 61-105.

"Interview with Professor Thomas F. Torrance." In *Different Gospels*, ed. Dr. Andrew Walker, 42-54. London: Hodder and Stoughton, 1988.

The Christian Frame of Mind: Reason, Order, and Openness in Theology in Theology and Natural Science. Colorado Springs: Helmers and Howard, 1989.

"The Hermeneutics of Erasmus." In *Probing the Reformed Tradition. Historical Studies in Honor of Edward. A. Dowey, Jr.*, ed. Elsie Anne McKee and Brian G. Armstrong, 48-76. Louisville, KY: Westminster, 1989.

Karl Barth, Biblical and Evangelical Theologian. Edinburgh: T & T Clarke, 1990.

"Fundamental Issues in Theology and Science." *Science and Religion. One World—Changing Perspectives on Reality,* ed. Jan Fennema and Iain Paul. Dordrecht/Boston/ London: University of Twente and Kluwer Academic Publishers, 1990.

"The Message of Pope John Paul II to Theologians and Scientists Commemorating the Third Centenary of Sir Isaac Newton's *Philosophiae Naturalis Principia Mathematica.* In *John Paul II On Science and Religion: Reflections on the New View from Rome,* ed. Robert John Russell et al., 105-112. Vatican: Vatican Observatory Publications, 1990.

"Thomas Torrance." In *Roundtable Conversations with European Theologians,* by Michael Bauman, 111-118. Grand Rapids, MI: Baker, 1990.

Science Théologique, Préface de l'édition française. Traduit de l'anglais par Jean-Yves Lacoste, 3-4. Paris: Presses Universitaires de France, 1990.

"The Transcendental Role of Wisdom in Science." In *Science et sagesse, Entretiens de l'Académie Internationale de Philosophie des Sciences,* ed. Evander Agazzi. *Défis et Dialogues—Herausforderung und Besinnung,* 14:63-80. Éditions Universitaires Fribourg Suisse— Universitätsverlag Freiburg Schseiz, Fribourg, 1991.

"The Enlightenment Reviewed." Review of *The Tradition of Scottish Philosophy: A New Perspective on the Enlightenment,* by Alexander Broadie. *CHAPMAN* (1991): 86-88.

The Mediation of Christ: Evangelical Theology and Scientific Culture. Edinburg: T & T Clark, 1992.

"The Transcendental Role of Wisdom in Science." *Progress in Theology,* September 1994, 3-4.

"The Transfinite Significance of Beauty in Science and Theology." *Progress in Theology,* September 1994, 4-5.

"Revelation, Creation and Law." *Heythorp Journal* 37 (1996): 273-283.

Ed. *Belief in Science and in Christian Life: The Relevance of Michael Polanyi's Thought for Christian Faith and Life*. Edinburgh: Handsel Press, 1980.

Ed. *Theology and Science in Mutual Modification*, by Harold B. Nebelsick. Vol. 2 of *Theology and Scientific Culture*. New York: Oxford University Press, 1981.

Ed. with Preface and Introduction. *A Dynamical Theory of the Electromagnetic Field*, by James Clerk Maxwell. Edinburgh: Scottish Academic Press, 1982.

Ed. *Science, Theology and Einstein*, by Iain Paul. Vol. 3 of *Theology and Scientific Culture*. New York: Oxford University Press, 1982.

Ed. *Axiomatics and Dogmatics*, by John B. Carnes. Vol. 4 of *Theology and Scientific Culture*. New York: Oxford University Press, 1982.

Ed. *Our Nuclear Future*? by Peter Hodgson. Vol. 5 of *Theology and Scientific Culture*. Belfast: Christian Journals, 1983.

Ed. *Circles of God: Theology and Science from the Greeks to Copernicus*, by Harold P. Nebelsick. *Theology and Science at the Frontiers of Knowledge*, vol. 2. Edinburgh: Scottish Academic Press, 1985.

Ed. *Science and Theology in Einstein's Perspective*, by Iain Paul. *Theology and Science at the Frontiers of Knowledge*, vol. 3. Edinburgh: Scottish Academic Press, 1986.

Ed. *Tradition and Authority in Science and Theology*, by Alexander Thompson. *Theology and Science at the Frontiers of Knowledge*, vol. 4. Edinburgh: Scottish Academic Press, 1987.

Ed. *Einstein and Christ. A New Approach to the Defense of the Christian Religion,* by Ralph G. Mitchell. *Theology and Science at the Frontiers of Knowledge,* vol. 5. Edinburgh: Scottish Academic Press, 1987.

Ed. *Transcendence and Providence, Reflections of a Physicist and Priest,* by W. G. Pollard. *Theology and Science at the Frontiers of Knowledge,* vol. 6. Edinburgh: Scottish Academic Press, 1987.

Ed. *Science and the Gospel,* by Victor Fiddes. *Theology and Science at the Frontiers of Knowledge,* vol. 7. Edinburgh: Scottish Academic Press, 1987.

Ed. *Being in Relation: A Theological Critique of Western Dualism and Individualism,* by Carver T. Yu. *Theology and Science at the Frontiers of Knowledge,* vol. 8. Edinburgh: Scottish Academic Press, 1987.

Ed. *Logic and Affirmation—Perspectives in Mathematics and Theology,* by John C. Puddefoot. *Theology and Science at the Frontiers of Knowledge,* vol. 9. Edinburgh: Scottish Academic Press, 1987.

Ed. *Creation and Scientific Interpretation,* by W. P. Carvin. *Theology and Science at the Frontiers of Knowledge,* vol. 10. Edinburgh: Scottish Academic Press, 1988.

Ed. *The Mirror of Creation,* by J. E. Ambrose. Vol. 11 of *Theology and Science at the Frontiers of Knowledge.* Edinburgh: Scottish Academic Press, 1989.

Ed. *Grounds for Reasonable Belief,* by Russell Stannard. *Theology and Science at the Frontiers of Knowledge,* vol. 12. Edinburgh: Scottish Academic Press, 1989.

Secondary Resources

Abrecht, Paul, and Roger Lincoln Shinn, eds. *Faith and Science in an Unjust World: Report of the World Council of Churches' Conference on Faith, Science and the Future*. Geneva: World Council of Churches, 1980.

Achtemeier, P. Mark. "The Truth of Tradition: Critical Realism in the Thought of Alasdair McIntyre and T. F. Torrance." *Scottish Journal of Theology* 47 (1994): 355-374.

Agnew, Mary Barbara. "The Concept of Sacrifice in the Eucharistic Theology of Donald M. Baillie, Thomas F. Torrance, and Jean-Jacques Von Allmen." Ph.D. diss., The Catholic University of America, 1972.

Aichele, George, Jr. "Literary Fantasy and Post-Modern Theology." *Journal of the American Academy of Religion* 59, no. 2 (1991): 323-337.

Alfaro, Juan. "Philosophy, Theology, and the Human Sciences." *Theology Digest* 22, no. 3 (Autumn 1974): 242-252.

Allen, Charles W. "Between Revisionists and Postliberals: A Review Article." *Encounter* 51 (1990): 389-401.

Allen, Diogenes. *Christian Belief in a Postmodern World: The Full Wealth of Conviction*. Louisville, KY: Westminster/John Knox Press, 1989.

_____. *Mechanical Explanations and the Ultimate Origin of the Universe According to Leibniz*. Wiesbaden: Steiner, 1983.

Ambrose, E. J. *The Mirror of Creation*. Edinburgh: Scottish Academic Press, 1990.

Anderson, Ray. *Historical Transcendence and the Reality of God: A Christological Critique*. Grand Rapids, MI: Eerdmans, 1975.

Anslem of Asota *Proslogion*. In *The Prayers and Meditations of St. Anslem*, trans. Benedicta Ward, 238-67. Harmondsworth, UK: Penguin Books, 1973.

Anslem of Canterbury *Cur Deus Homo.* Edinburgh: John Grant, 1909.

_____ *Basic Writings.* La Salle, IL: Open Court, 1962.

Aquinas, Thomas. *On the Truth of the Catholic Faith: Summa Contra Gentiles.* Translated by A. C. Pegis et al. 4 vols. Garden City, NY: Image Books, 1955-57.

_____. *Summa Theologica.* Translated by English Dominican Province, 3 vols. New York: Benzinger, 1947/48.

Arden, John Boghosian. *Science, Theology, and Consciousness: The Search for Unity.* Westport, CT: Praeger, 1997.

Aristotle *Nichomean Ethics.* New York: E. Dutton, 1911.

Armstrong, John H., ed. *Current Challenges to the Authority of Scripture and the Gospel: The Coming Evangelical Crisis.* Chicago: Moody Press, 1996.

Arnold, Steve Richard. "Scientific Research Programs and the Nature of Theology: An Analogy of Lakatos' Model of the Nature of Science to the Nature of the Theology of John Hick." Ph.D. thesis, Golden Gate Baptist Theological Seminary, 1987.

Asimov, Isaac. "The 'Threat' of Creationism." In *Religion and the Natural Sciences: The Range of Engagement,* ed. James E. Huchingson, 275-284. Fort Worth: Harcourt Brace Jovanovich, 1993.

Atkinson, David John. "The Theological Method of T. F. Torrance." M.L. thesis, University of Bristol, 1973.

Augustine *Against Julian.* New York: Fathers of the Church, 1957.

_____. *The Trinity.* Washington, DC: Catholic University of America Press, 1963.

Austin, William H. *The Relevance of Natural Science to Theology.* New York: Macmillan Press, 1976.

Avis, Paul. *The Methods of Modern Theology: The Dream of Reason.* London: Marshall Pickering, 1986.

_____. "Does Natural Theology Exist?" *Theology* 87 (1984): 431-437.

_____. *Faith in the Fires of Criticism: Christianity in Modern Thought*. London: Darton, Longman & Todd, 1995.

Ayres, Clarence E. *Science the False Messiah and Holier Than Thou*. New York: Augustus M. Kelley, 1973.

Ayers, Robert H. *Christian Theology in a Contemporary World*. Lewiston: E. Mellen Press, 1997.

Baelz, Peter R. *Christian Theology and Metaphysics*. Philadelphia: Fortress Press, 1968.

Baillie, John. *Natural Science and the Spiritual Life*. New York: Charles Scribner's Sons, 1952.

Balasuriya, Tissa. *Planetary Theology*. Maryknoll, NY: Orbis Books, 1984.

Baldwin, John T. "God and the World: William Paley's Argument from Perfection Tradition--A Continuing Influence." *Harvard Theological Review* 1 (1992): 109-120.

_____. "Historization and Christian Theological Method." *Journal of the Adventist Theological Society* 4, no. 2 (1993): 161-171.

_____. "Inspiration, the Natural Sciences, and a Window of Opportunity." *Journal of the Adventist Theological Society* 5, no. 1 (1994): 131-154.

_____. "Progressive Creationism and Biblical Revelation." *Journal of the Adventist Theological Society* 3, no. 1 (1992): 105-119.

_____, ed. *Creation, Catastrophe, and Calvary: Why a Global Flood Is Vital to the Doctrine of the Atonement*. Hagerstown, MD: Review and Herald, 2000.

Ballagas, J. E. "Ellen White's Concept of the Hermeneutic Principle-The Bible Its Own Interpreter and Some of the Implications Related to the Use of Secondary Sources in Biblical Investigation." M.A. Project Report, Andrews University, 1980.

Banner, Michael C. *The Justification of Science and the Rationality of Religious Belief*. Oxford: Clarendon Press, 1990.

Barbour, Ian. *Christianity and the Scientist*. New York: Association Press 1960.

_____. *Myths, Models, and Paradigms*. New York: Harper & Row, 1974.

_____. *Religion and Science: Historical and Contemporary Issues*. San Francisco: HarperSanFrancisco, 1997.

_____. *Religion in an Age of Science*. Gifford Lectures. San Francisco: Harper, 1990.

_____. "Science and Religion Today." In *Science and Religion, New Perspectives on the Dialogue*. New York: Harper and Row, 1968.

_____. "Surveying the Possibilities: Ways of Relating Science and Religion." In *Religion and the Natural Sciences: The Range of Engagement*, ed. James E. Huchingson, 6-34. Fort Worth: Harcourt Brace Jovanovich, 1993.

_____, comp. *Science and Religion: New Perspectives on the Dialogue*. London, S.C.M. Press, 1968.

Barclay, Oliver R. *The Christian's Approach to University Life*. London: Inter-Varsity Fellowship, 1963.

_____. *Developing a Christian Mind*. Leicester: Inter-Varsity, 1984.

_____. *The Intellect and Beyond*. Grand Rapids, MI: Academie Books, 1985.

Barnes, Ross O. "Biblical Creationism After a Century of Scientific Investigation." *Spectrum* 10, no. 1 (May 1979): 2-11.

Barr, James. *Biblical Chronology, Legend or Science?* London: University of London, 1987.

_____. *Biblical Faith and Natural Theology.* Oxford: Clarendon Press, 1993.

_____. *The Semantics of Biblical Language.* Oxford: Oxford University Press, 1961.

Barrow, James, and Frank Tipler. *The Anthropic Cosmological Principle.* New York: Oxford University Press, 1986.

Barth, Karl. *Anslem: Fides Quarens Intellectum: Anselms Proof of the Existence of God in the Context of His Theological Scheme.* Translated by I. W. Robertson. London: SCM Press, 1960.

_____. *Church Dogmatics.* Edinburgh: T & T Clark, 1936-1969.

_____. *The Humanity of God.* Richmond, VA: John Knox Press, 1960.

_____. "The Paradoxical Nature of the 'Positive Paradox': Answers and Questions to Paul Tillich." In *The Beginnings of Dialectical Theology,* ed. James M. Robinsion, 142-154. Richmond, VA: John Knox Press, 1962.

Bartholomew, Craig. "Post/Late? Modernity as the Context for Christian Scholarship Today." *Themelios* 22 (January 1997): 25-38.

Barton, John. *People of the Book? The Authority of the Bible in Christianity.* London: SPCK, 1988.

Baruss, Imants. *Authentic Knowing: The Convergence of Science and Spiritual Aspiration.* West Lafayette, IN: Purdue Research Foundation, 1996.

Bauman, Michael, Lissa Roche, and Jon Corombos, eds. *Man and Creation: Perspectives on Science and Theology.* Hillsdale, MI: Hillsdale College Press, 1993.

Bavinck, Herman. *The Philosophy of Revelation*. Grand Rapids, MI: Eerdmans, 1953.

Bedau, Hugo Adam. "Complementarity and the Relation between Science and Religion." *Zygon* 9, no. 3 (September 1974): 202-224.

Beek, Frans Jozef van. "Divine Revelation: Intervention or Self-Communication?" *Theological Studies* 52 (1991): 199-226.

Bell, Bernard Iddings. *Religion for Living: A Book for Postmodernists*. New York: Harper, 1940.

Ben-David, Joseph. "The Scientific Role: The Conditions of Its Establishment in Europe." *Minerva* (1965): 15-50.

Benne, Robert. *The Paradoxical Vision: A Public Theology for the Twenty-first Century*. Minneapolis: Fortress Press, 1995.

Benton, Roy. "Odyssey of an Adventist Creationist." *Spectrum* 15, no. 2 (1984): 46-53.

Berger, Peter. "Secular Theology and the Rejection of the Supernatural: Reflections on Recent Trends." *Theological Studies* 38 (March 1977): 39-56.

Berkhof, Louis. "Theology as a Science." In *Introduction to Systematic Theology*. Grand Rapids, MI: Baker Book House, 1979.

Berry, P., and A. Wernick, eds. *Shadow of Spirit: Postmodernism and Religion*. New York: Routledge, 1992.

Berry, R. J. "Scientific Fraud and Scientific Method." *Science and Christian Belief* 6, no. 1 (1994): 61-64.

Bessinger, Donivan. *Religion Confronting Science and There Was Light*. Greenville, SC: Orchard Park Press, 1991.

Bevans, Stephen B. *Models of Contextual Theology*. Maryknoll, NY: Orbis Books, 1993.

Bewkes, Eugene, et al. *The Western Heritage of Faith and Reason*. New York: Harper and Row, 1963.

Beza, Theodore. *Tarctationes theologicae* (1570-82).

Biderman, Shlomo. *Scripture and Knowledge: An Essay on Religious Epistemology.* New York: E. J. Brill, 1995.

Birch, Charles. *Born Again Science and Technology.* Perth, WA: Murdoch University, 1982.

_____. *Nature and God.* London: SCM Press, 1965.

Birtel, Frank T. "Choosing God and Choosing Man: A Postmodern Challenge." In *Reasoned Faith,* ed. Frank T. Birtel, 156-70. New York: Crossroad, 1993.

_____, ed. *Reasoned Faith.* New York: Crossroad, 1993.

Bishop, Paul Estler. "Langdon Gilkey's Prolegomenon to Theology." M.A. thesis, American University, 1981.

Bishop, Steve. "Review of *Biblical Faith and Natural Theology* by Barr." *Science and Christian Belief* 6, no. 2 (1994): 147-148.

Blaikie, Robert J. *'Secular Christianity' and God Who Acts.* Grand Rapids, MI: Eerdmans, 1970.

Blamires, Harry. *The Christian Mind.* Ann Arbor, MI: Servant Books, 1978.

Bloom, Allan. *The Closing of the American Mind.* New York: Simon & Schuster, 1988.

Bobulsky, Steven E. "Evolutionary Theory, Creation Science, and Orthodox Theology." M.Div. thesis, St. Vladimir's Orthodox Theological Seminary, 1981.

Bockmuehl, Klaus. *The Unreal God of Modern Theology.* Colorado Springs: Helmers & Howard, 1988.

Bonsor, Jack Arthur. *Athens and Jerusalem: The Role of Philosophy in Theology.* Mahwah, NJ: Paulist Press, 1993.

Booth, Wayne C. "Systematic Wonder: The Rhetoric of Religion." *Journal of the American Academy of Religion* 53, no. 4 (December 1985): 677-702.

Borgmann, Albert. *Crossing the Postmodern Divide*. Chicago: University of Chicago Press, 1992.

Bower, Keith Daniel. "Scientific Epistemology in the Theological Method of Thomas F. Torrance." M.A. thesis, Dallas Theological Seminary, 1987.

Braithwaite, R. B. *Scientific Explanation*. Cambridge, England: Cambridge University Press, 1953.

Brand, Leonard. *Faith, Reason and Earth History*. Berrien Springs, MI: Andrews University Press, 1997.

Brewer, Elmer Woodson. "The Approaches of John Polkinghorne, Arthur Peacocke, and Ian Barbour for the Integration of Natural Science and Christian Theology." Ph.D. thesis, Southern Baptist Theological Seminary, 1995.

Briggs, Charles Augustus. *The Bible the Church and the Reason: The Three Great Fountains of Divine Authority*. New York: Scribner's, 1892.

Brill, Susan B. *Wittgenstein and Critical Theory: Beyond Post-modernism and Toward Descriptive Investigations*. Athens: Ohio University Press, 1995.

Brooke, John Hedley. *Science and Religion: Some Historical Perspectives*. Cambridge: Cambridge University Press, 1991.

Brown, Delwin. *Boundaries of Our Habitations: Tradition and Theological Construction*. New York: State University of New York Press, 1994.

_____. "Struggle Till Daybreak: On the Nature of Authority in Theology." *The Journal of Religion* 65, no. 1 (January 1985): 15-32.

Brown, Harold. "On Method and Means in Theology." In *Doing Theology in Today's World*, ed. John Woodbridge and Thomas McComiskey, 147-170. Grand Rapids, MI: Zondervan, 1991.

Brown, James. *Subject and Object in Modern Theology*. New York: Macmillan, 1955.

_____. *The Rational and the Social*. New York: Routledge, 1989.

Brown, Robert McAfee. *Is Faith Obsolete?* Philadelphia: Westminster Press, 1974.

_____. *Theology in a New Key: Responding to Liberation Themes*. Philadelphia: Westminster Press, 1978.

Brown, Raymond E. *The Sensus Plenior of Sacred Scripture*. Baltimore, MD: St. Mary's University, 1955.

Brueggermann, Walter. *The Bible and Postmodern Imagination: Texts Under Negotiation*. London: SCM, 1993.

Brummer, Vincent. *Speaking of a Personal God--Philosophical Theology*. New York: Cambridge University Press, 1992.

_____, ed. *Interpreting the Universe as Creation: A Dialogue of Science and Religion*. Kampen, Netherlands: Kok Pharos, 1991.

Brubaker, Malcolm R. "Postmodernism and Pentecostals: A Case Study of Evangelical Hermeneutics." *Evangelical Journal* 15 (Spring 1997): 3-45.

Brunner, Emil. *Revelation and Reason*. Philadelphia: Westminster, 1946.

Bube, Richard, "The Failure of the God of the Gaps." In *Religion and the Natural Sciences: The Range of Engagement*, ed. James E. Huchingson, 131-141. Fort Worth: Harcourt Brace Jovanovich, 1993.

_____. "The Nature of Science." In *The Encounter Between Christianity and Science*, ed. Richard H. Bube, 17-42. Grand Rapids, MI: Eerdmans, 1968.

Bunge, Mario. "What Is Pseudoscience?" *The Skeptical Inquirer* 9 (Fall 1984): 36-46.

Burhoe, Ralph Wendell. *Toward a Scientific Theology*. Belfast: Christian Journals, 1981.

_____. "Attributes of God in an Evolutionary Universe." In *Religion and the Natural Sciences: The Range of Engagement,* ed. James E. Huchingson, 298-307. Fort Worth: Harcourt Brace Jovanovich, 1993.

Burke, Peter. "Religion and Secularization." In *The New Cambridge Modern History,* 13:293-317. Cambridge: Cambridge University Press, 1979.

Burnham, Frederic B., ed. *Postmodern Theology: Christian Faith in a Pluralist World.* San Francisco: Harper and Row, 1989.

Burrell, David B. "God, Religious Pluralism, and Dialogic Encounter." In *Reconstructing Christian Theology,* ed. Rebecca S. Chopp and Mark Lewis Taylor, 49-78. Minneapolis, MN: Augsburg Fortress, 1994.

_____. "Creation or Emanation: Two Paradigms of Reason." In *God and Creation,* ed. David B. Burrell and Bernard McGinn, 27-37. Notre Dame: University of Notre Dame Press, 1990.

Burrell, David B., and Bernard McGinn, eds. *God and Creation: An Ecumenical Symposium.* Notre Dame: University of Notre Dame Press, 1990.

Byers, David M., ed. *Religion, Science and the Search for Wisdom.* Washington, DC: National Conference of Catholic Bishops, 1987.

Byl, John. "Scripture and Geologists." *Westminster Theological Journal* 51, no. 1 (Spring 1989): 143-152.

Bynum, William F. *Dictionary of the History of Science.* Princeton, NJ: Princeton University Press, 1981.

Caird, E. *Evolution of Theology in the Greek Philosophers.* New York: Kraus Reprint, 1968.

Cairns, David. "Natural Theology." In *A Handbook of Christian Theology: Definition Essays on Concepts and Movements of Thought in Contemporary Protestantism,* ed. Martin Halverson and Arthur Cohen, 249-256. New York: World Publishing Co., 1958.

Calvin, John. *Institutes of the Christian Religion.* Translated by Henry Beveridge. 2 vols. London: James Clarke, 1953.

Campbell, Dennis M. *Authority and the Renewal of American Theology.* Cleveland, OH: United Church Press, 1976.

Campbell, Norman. *What Is Science?* New York: Dover Publications, 1953.

Canale, Fernando Luis. "Revelation and Inspiration: Method for a New Approach." *Andrews University Seminary Studies* 31, no. 3 (1993): 171-194.

_____. "Revelation and Inspiration: The Classical Model." *Andrews University Seminary Studies* 32, no. 2 (1994) 7-28.

_____. "Revelation and Inspiration: The Liberal Model." *Andrews University Seminary Studies* 32, no. 3 (1994): 169-195.

_____. "Revelation and Inspiration: The Historical-Cognitive Model." *Andrews University Seminary Studies* 33 (1995): 5-38.

_____. *A Criticism of Theological Reason: Time and Timelessness as Primordial Presuppositions.* Berrien Springs, MI: Andrews University Press, 1987.

Cargal, Timothy B. "Beyond the Fundamentalist-Modernist Controversy: Pentecostals and Hermeneutics in a Postmodern Age." *Pneuma* 15 (1993): 163-188.

Carvin, W. P. *Creation and Scientific Explanation.* Edinburgh: Scottish Academic Press, 1988.

Cauthen, Kenneth. *Christian Biopolitics: A Credo & Strategy for the Future.* Nashville: Abingdon, 1971.

_____. *Science, Secularization & God: Toward a Theology of the Future.* Nashville: Abingdon Press, 1969.

_____. "A Typological Analysis of the Thought of Reinhold Niebuhr in the Nature and Destiny of Man and Faith and History Regarding the Problem of Christ and Culture." M.A. thesis, Emory University, School of Theology, 1955.

_____. *Theological Biology: Case for a New Modernism.* Queenstown, Ontario: E. Mellen, 1992.

Chant, Colin, and John Fauvel, eds. *Darwin to Einstein: Historical Studies on Science and Belief.* New York: Longman, 1980.

Chenu, Marie-Dominique. *Is Theology a Science*? New York: Hawthorn Books, 1959.

Cherbonnier, Edmond L. "Is There a Bible Metaphysic?" *Theology Today* 15, no. 4 (January 1959): 454-469.

Choo, Charles Chinyoung. "Quantum Reality: Some Implications for Christian Theology." M.A. thesis, Andrews University, Seventh-day Adventist Theological Seminary, 1993.

Christian, C. W., and Glenn R. Wittig, eds. *Radical Theology: Phase Two, Essays in a Continuing Discussion.* Philadelphia: J. B. Lippincott, 1967.

Clark, Harold W. "Traditional Adventist Creationism: Its Origin, Development, and Current Problems." *Spectrum* 3, no. 1 (1971): 7-18.

Clark, Gordon H. *The Philosophy of Science and Belief in God.* Nutley, NJ: Craig Press, 1964.

Clarke, Robert E. D. *Science and Christianity: A Partnership.* Mountain View, CA: Pacific Press, 1972.

Clarke, Samuel. *A Discourse Concerning the Being and Attributes of God, the Obligations of Natural Religion, and the Truth and Certainty of the Christian Revelation.* London: Botham for Knapton, 1732.

Clayton, John Powell. *The Concept of Correlation: Paul Tillich and the Possibility of a Mediating Theology.* New York: W. de Gruyter, 1980.

Clayton, Philip. *Explanation from Physics to Theology: An Essay on Rationality and Religion.* New Haven: Yale University Press, 1989.

Clifford, Anne M. "Creation." In *Systematic Theology: Roman Catholic Perspectives,* ed. Francis Schüssler Fiorenza and John P. Galvin, 1:195-248. Minneapolis: Fortress Press, 1991.

_____. "The Relation of Science and Religion/Theology in the Thought of Langdon Gilkey." Ph.D. diss., The Catholic University of America, 1988.

Clouser, Roy A. *The Myth of Religious Neutrality: An Essay on the Hidden Role of Religious Belief in Theories.* Notre Dame: University of Notre Dame Press, 1991.

Cobb, John. "From Crisis Theology to the Postmodern World." *Centennial Review* 8 (1964): 209-220.

_____. *God and the World.* Philadelphia: Westminster Press, 1969.

Cohen, Jeremy. "The Bible, Man, and Nature in the History of Western Thought: A Call for Reassessment." *The Journal of Religion* 65, no. 2 (April 1985): 155-172.

Collins, Adela Yarbro. "The Physical World in the Book of Revelation." *The Bible Today* 26, no. 3 (May 1988): 156-159.

Collingwood, R. *The Idea of Nature.* Oxford: Clarendon Press, 1945.

Collins, John. "New Testament Cosmology." In *Cosmology and Theology,* ed. David Tracy and Nicholas Lash. New York: Seabury Press, 1983.

Colyer, Elmer Monroe. "The Nature of Doctrine in the Theology of T. F. Torrance." Ph.D. diss., Boston College, 1992.

Connor, Steven. *Postmodernist Culture: An Introduction to Theories of the Contemporary.* Oxford: Basil Blackwell, 1989.

Cook, Martin L. *The Open Circle: Confessional Method in Theology*. Minneapolis: Augsberg Fortress, 1991.

Cooke, Bernard J. *The Distancing of God: The Ambiguity of Symbol in History and Theology*. Minneapolis: Fortress Press, 1990.

Corey, Michael Anthony. *God and the New Cosmology: The Anthropic Design Argument*. Lanham, MD: Rowman & Littlefield, 1993.

Coulson, C. A. *Science and Religion: A Changing Relationship*. Cambridge: Cambridge University Press, 1955.

Courperus, Molleurus. "Tensions Between Religion and Science." *Spectrum* 10, no. 4 (1980): 74-88.

Crawshay-Williams, Rupert. *Methods and Criteria of Reasoning: An Inquiry into the Structure of Controversy*. New York: Humanities Press, 1957.

Crewdson, Joan. *Christian Doctrine in the Light of Michael Polanyi's Theory of Personal Knowledge: A Personalist Theology*. Lewiston: Edwin Mellen Press, 1994.

Crist, Carol P. "Roundtable Discussion: What Are the Sources of My Theology?" *Journal of Feminist Studies in Religion* 1 (1985): 119-131.

Csikszentmihalyi, Mihaly. "Consciousness for the Twenty-first Century." *Zygon* 26 (March): 13-14.

Curran, Charles E. *Theology, Science, Technology and the Future of Man*. Niles, IL: Argus Communications, 1972.

Da Cruz, Eduardo Rodrigues. "The Ambivalence of Science: A Theological Study Informed by the Thought of Paul Tillich and the Latin American Experience." Th.D. thesis, Lutheran School of Theology at Chicago, 1987.

Dalferth, Ingolf U. "Karl Barth's Eschatological Realism." In *Karl Barth: Centenary Essays*, ed. S. W. Sykes. Cambridge: Cambridge University Press, 1989.

Dampier, W. *A History of Science and Its Relations with Philosophy and Religion.* Cambridge: Cambridge University Press, 1946.

Damsteegt, P. Gerard. *Foundations of the Seventh-day Adventist Message and Mission.* Grand Rapids, MI: Eerdmans, 1977.

Davaney, Shelia Greeve. "Options in Post-Modern Theology." *Diolog* 26, no. 3 (Summer 1987): 196-200.

_____, ed. *Theology at the End of Modernity.* Philadelphia: Trinity Press International, 1991.

Davies, Paul. *God and the New Physics.* New York: Simon and Schuster, 1983.

Davidheiser, Bolton. *Evidence of God in Nature.* San Diego, CA: Creation-Science Research Center, 1973.

Davis, George E. "Langdon Gilkey and Religious Language." M.C.S. thesis, Regent College, 1979.

Dawkins, Richard. "The Awe Factor." *The Skeptical Inquirer* 17 (Spring 1993): 242-243.

Dawson, Christopher H. *Progress and Religion.* London: Sheed and Ward, 1938.

de Groot, Mart. "Cosmology and Genesis: The Road to Harmony and the Need for Cosmological Alternatives." *Origins* 19, no. 1 (1992): 8-32.

_____. "God and the Big Bang: The Bible and the Origin of the Universe." *Adventist Review,* August 13, 1992, 12-14.

Demarest, Bruce, and Gordon Lewis. *Integrative Theology: Knowing Ultimate Reality, The Living God.* Grand Rapids, MI: Academie Books, 1987.

Dembski, William A. "What Every Theologian Should Know About Creation, Evolution, and Design." *The Princeton Theological Review* 2, no. 3 (October 1995): 15-21.

Dennett, Daniel C. "Darwin's Dangerous Idea." *The Sciences*, May/June 1995, 34-40.

Descartes, René. *The Philosophical Works of Descartes.* Translated by E. Haldane and G. Ross. Cambridge: Cambridge University Press, 1931.

Dessauer, Friedrich. *Religion im Lichte der heutigen Naturwissenschaft.* Aufl. Frankfurt am Main: J. Knecht, 1952.

Dillenberger, John. *Countours of Faith: Changing Forms of Christian Thought.* Nashville: Abingdon Press, 1969.

_____. *Protestant Thought and Natural Science: A Historical Interpretation.* Garden City, NY: Doubleday and Co., 1960.

Dillstone, F. W., ed. *Myth and Symbol.* London: S.P.C.K., 1966.

Dippel, Cornelis. "Liturgy in the World of the Sciences, Technology and Commerce." In *Concillium: Liturgy in Transition*, ed. Herman Schmidt, 98-108. New York: Herder and Herder, 1971.

Ditmanson, Harold H. "The Call for a Theology of Creation." *Dialog* 3, no. 4 (Fall 1964): 264-273.

Dockery, David S., ed. *The Challenge of Postmodernism: An Evangelical Engagement.* Wheaton, IL: Victor Books, 1995.

Dooyeweerd, Herman. *Christian Philosophy and the Meaning of History.* Lewiston: E. Mellen Press, 1996.

Doren, Charles Van. *A History of Knowledge.* New York: Carol Publishing Group, 1991.

Dornisch, Loretta. "Symbolic Systems and the Interpretation of Scripture: An Introduction to the Work of Paul Ricoeur." *Semia* 4 (1975): 1-19.

Dowey, Edward A. "Tillich, Barth, and the Criteria of Theology." *Theology Today* 15, no. 1 (April 1958): 43-58.

Downey, John Kenneth. "Wittgenstein and the Foundations of Theology." Ph.D. diss., Marquette University, 1983.

Draper, John. *History of the Conflict Between Science and Religion*. New York: Appleton, 1874.

Drees, William. "Postmodernism and the Dialogue between Religion and Science." *Zygon* 32 (December 1997): 525-542.

_____. *Religion, Science and Naturalism*. Cambridge: Cambridge University Press, 1996.

Driscoll, Jeremy. "Prolegomenon in the Theological Method of Langdon Gilkey." M.A. thesis, Mount Angel Seminary, 1980.

Driver, Tom. Review of *Naming the Whirlwind: The Renewal of God-Language*, by Langdon Gilkey. *Union Seminary Quarterly Review* 25, no. 3 (Spring 1970): 361-367.

Dulles, Avery Robert. *The Craft of Theology: From Symbol to System*. New York: Crossroads, 1992.

_____. *Models of Revelation*. Marynoll, NY: Orbis Books, 1992.

Duns Scotus, Johannes. *A Treatise on God as First Principle*. Translated and edited by A. B. Wolter. Chicago: Forum Books, 1966.

Du Toit, C. W. *The Action of God in the World: Proceedings of the Second Seminar of the South African Science and Religion Forum (Sasrf) of the Research Institute for Theology and Religion Held at Unisa on 23 May, 1994*. Pretoria, South Africa: Research Institute for Theology and Religion, University of South Africa, 1994.

Dyson, Freeman. "A Universe by Design? A Growing God." In *Religion and the Natural Sciences: The Range of Engagement*, ed. James E. Huchingson, 209-231. Fort Worth, TX: Harcourt Brace Jovanovich, 1993.

Eaves, Lindon. "Spirit, Method and Content in Science and Religion: The Theological Perspective of a Geneticist." *Zygon* 24 (1989): 185-215.

Edwards, J. *An Enquiry into Four Remarkable Texts of the New Testament*. Cambridge: W. Graves, 1692.

Edwards, O. O. "Historical-Critical Method's Failure of Nerve and a Prescription for a Tonic: A Review of Some Recent Literature." *American Theological Review* 59 (1977): 115-134.

Ellis, J. *Some Brief Considerations upon Mr. Locke's Hypothesis*. London: J. Watts, 1743.

Erickson, Millard. *The New Evangelical Theology*. Westwood, NJ: Fleming H. Revell Co., 1968.

Evans, Danna. "How Do Adventist Students Think About Creation and Evolution?" *Spectrum* 20, no. 1 (1989): 47-53.

Evans, Gillian Rosemary. *The Science of Theology*. Grand Rapids, MI: Eerdmans, 1986.

Eve, Raymond A., and Dana Dunn. "High School Biology Teachers and Pseudoscientific Belief: Passing It On?" *The Skeptical Inquirer* 13 (Spring 1989): 260-263.

Ann Evory, ed. *Contemporary Authors*, vol. 7. Detroit, MI: Book Tower, 1982.

Fackre, Gabriel. *The Christian Story*. Vol. 1, *A Narrative Interpretation of Basic Christian Doctrine*. Rev. ed. Grand Rapids: Eerdmans, 1984.

_____. *The Christian Story*. Vol. 2, *Authority: Scripture in the Church for the World*. Grand Rapids: Eerdmans, 1987.

_____. "Faith and the Science-man Questions." *Christianity and Crisis* 27 (1968): 315-318.

Fairlamb, Horace L. *Critical Conditions: Postmodernity and the Question of Foundations*. Cambridge: Cambridge University Press, 1994.

Farley, Edward. *Ecclesial Man: A Social Phenomenology of Faith and Reality*. Philadelphia: Fortress Press, 1975.

Farrer, Austin. *A Science of God?* London: Geoffrey Bles, 1966.

Faucault, Michel. *The Archeology of Knowledge.* Translated by A. M. Sheridan Smith. New York: Random House, 1972.

Ferré, Frederick. *Being and Value: Toward a Constructive Postmodern Metaphysics.* Albany: State University of New York Press, 1996.

_____. "Cosmos: Child of Science? Theoretical Intelligence and Epistemic Norms." *Philosophy of Religion* 31 (1992): 149-163.

_____. "Einstein on Religion and Science." *American Journal of Theology and Philosophy* 1, no. 1 (1980): 21-28.

_____. *Exploring the Logic of Faith: A Dialogue on the Relation of Modern Philosophy to Christian Faith.* New York: Association Press, 1962.

_____. *Language, Logic, and God.* New York: Harper, 1961.

_____. "Mapping the Logic of Models in Science and Theology." In *New Essays in Religious Language,* 265-294, ed. Dallas High. New York: Oxford University Press, 1969.

_____. "Metaphors, Models, and Religion." *Soundings* 51 (1968): 327-345.

_____. "Nels F. S. Ferre on Ultimate Reality and the Meaning of Human Life." *Ultimate Reality and Meaning* 9, no. 2 (1986): 103-116.

_____. "Religious World Modeling and Postmodern Science." *Journal of Religion* 62 (1982): 261-271.

_____. "A Renewal of God Language?" *Journal of Religion* 52 (July 1972): 286-304.

_____. "Science, Religion and Experience." *Bangalore Theological Forum* 14 (1982): 1-19.

_____. *Shaping the Future: Resources for the Post-modern World.* New York: Harper & Row, 1976.

_____. "Technological Faith and Christian Doubt." *Faith and Philosophy* 8 (1991): 214-224.

_____. *Technology and Religion.* Greenwich, CT: Jai Press, 1990.

_____. "Towards Exploiting Polanyi's Resources on Ultimate Reality and Meaning: Gulick's 'Michael Polanyi's Theory of Meaning and Reality'." *Ultimate Reality and Meaning* 10 (1987): 142-145.

Ferré, Nels Frederick Solomon. "Contemporary Theology in the Light of 100 Years." *Theology Today* 15, no. 3 (October 1958): 366-376.

_____. *Faith and Reason.* New York: Harper & Brothers, 1969 1946.

Feyerabend, Paul. *Against Method.* New York: Verso, 1993.

_____. *Realism, Rationalism and the Scientific Method: Philosophica Papers.* Vols. 1 and 2. Cambridge: Cambridge University Press, 1985.

Fiddes, Victor H. *Science and the Gospel.* Edinburgh: Scottish Academic Press, 1987.

Finger, T. "Modernity, Postmodernity—What in the World Are They?" *Transformation* 10 (1993): 353-368.

Fiorenza, Elizabeth S. "The Bible, the Global Context, and the Discipleship of Equals." In *Reconstructing Christian Theology,* ed. Rebecca S. Chopp and Mark Taylor, 79-87. Minneapolis, MN: Augsburg Fortress, 1994.

Fletcher, Stephen E. *Heidegger: Theology as Science*? M.A. thesis, University of Kansas, 1986.

Ford, David F. "Review of *Reality and Scientific Theology.*" *Scottish Journal of Theology* 41 (1988): 273-280.

Forster, R., and P. Marston. *Christianity, Evidence and Truth*. Crowborough: Monarch, 1995.

Foster, M. B. "The Christian Doctrine of Creation and the Rise of Modern Natural Science." *Mind* 43 (1934): 446-468; 44 (1935): 439-466; 45 (1936): 1-27.

_____. "Religion in the Universities." *Modern Churchman* 42 (1952): 212-218.

Fowler, Whitem R. "Does God Speak Today Apart from the Bible?" In *Current Challenges to the Authority of Scripture and the Gospel: The Coming Evangelical Crisis*, ed. John H. Armstrong, 77-90. Chicago: Moody Press, 1996.

Fowler, W. *The Development of Scientific Method*. New York: Macmillan, 1962.

Fox, Matthew. *Natural Grace: Dialogues on Creation, Darkness, and the Soul in Spirituality and Science*. New York: Doubleday, 1996.

Frame, John M. *The Doctrine of the Knowledge of God*. Phillipsburg, NJ: Presbyterian and Reformed Publishing Company, 1987.

Frankenberry, Nancy. *Religion and Radical Empiricism*. Albany: State University of New York Press, 1987.

Frazier, Kendrick. "The Creationist Threat: Science Finally Awakens." *The Skeptical Inquirer* (Spring 1982): 2-6.

Frei, Hans. "The Doctrine of Revelation in the Thought of Karl Barth, 1909-1922: The Nature of Barth's Break with Liberalism." Ph.D. diss., Yale University, 1956.

_____. "The 'Literal Reading' of Biblical Narative in the Christian Tradition: Does It Streach or Will It Break?" In *The Bible and the Narrative Tradition*, ed. Frank McConnell. New York: Oxford University Press, 1986.

Fritzmeyer, Joseph A. *Scripture, the Soul of Theology*. New York: Paulist Press, 1994.

Frye, Roland, ed. *Is God a Creationist: The Religious Case against Creation-Science*. New York: Scribner's, 1983.

Fuller, Michael. *Atoms and Icons: A Discussion of the Relationships Between Science and Theology*. London: Mowbray, 1995.

Funk, Robert. *Language, Hermeneutic, and Word of God*. New York: Harper and Row, 1966.

Gadamer, Hans-Georg. *Truth and Method*. Translated and edited by Garrett Barden and John Cumming. New York: Crossroad, 1975.

Galilee, David. Review of Torrance's *Theological Science*. *Religious Studies* 7, no. 4 (December 1971): 375-377.

Gartner, Bertil. *The Areopagus Speech and Natural Revelation*. Translated by Carolyn Hanney King. Uppsala: Almquist and Wiksells, 1955.

Geach, P. T. *Reference and Generality*. Ithica, NY: Cornell University Press, 1980.

Geffré, Claude. *The Risk of Interpretation*. Mahwah, NJ: Paulist Press, 1987.

Geffré, Claude, and Jean-Pierre Jossua. "Towards a Theological Interpretation of Modernity." *Concilium* (December 1992): vii-xi.

_____, eds. *The Debate on Modernity*. London: SCM Press, 1992.

Geisler, Norman L., and J. Kerby Anderson. *Origin Science: A Proposal for the Creation-Evolution Controversy*. Grand Rapids, MI: Baker Book House, 1987.

Gelder, C. van. "Postmodernism as an Emerging World View." *Calvin Theological Journal* 26 (1991): 412-417.

Gellner, Ernest. *Postmodernism, Reason and Religion*. New York: Routledge, 1992.

Gerhart, Mary, and Allan Melvin Russell. *Metaphoric Process: The Creation of Scientific and Religious Understanding.* Fort Worth: Texas Christian University Press, 1984.

Gerrish, B. A. *Continuing the Reformation: Essays on Modern Religious Thought.* Chicago: University of Chicago Press, 1993.

_____. "The Reformation and the Rise of Modern Science." In *The Impact of the Church Upon Its Culture—Reappraisals of the History of Christianity,* ed. Jerald C. Brauer. Chicago: University of Chicago Press, 1968.

Giberson, Karl. *Worlds Apart: The Unholy War Between Religion and Science.* Kansas City, MO: Beacon Hill Press, 1993.

_____. "Intelligent Design on Trial—A Review Essay." *Christian Scholars Review* 24, no. 4 (1995): 459-471.

Gibson, L. J. "Theistic Evolution: Is It for Adventists?" *Ministry* (January 1992): 22-25.

Gifford, Paul. "The Sola Scriptura Ideal: The Almost Normative Status of a Purely Contingent Theological Tradition." *Journal of Theology for South Africa* 57 (1986): 43-56.

Gill, Jerry. *Mediated Transcendence.* Macon, GA: Mercer University Press, 1989.

_____. "Review of *Theological Science.*" *Christian Century* 86 (October 29, 1969): 1386.

Gillispie, Charles Coulston. "Geology and Genesis the Relationship of Natural Theology to Scientific and Social Opinion in Great Britain, 1790-1850." Ph.D. thesis, Harvard University, 1948.

Gilson, Étienne. *Reason and Revelation in the Middle Ages.* New York: Charles Scribner's Sons, 1938.

_____. *The Unity of Philosophical Experience.* New York: Charles Scribner's Sons, 1947.

Gish, Duane T. *Evolution? The Fossils Say No*! San Deigo: Creation-Life Publishers, 1977.

_____. "Evolution a Philosophy, Not a Science." In *Religion and the Natural Sciences: The Range of Engagement,* ed. James E. Huchingson, 265-274. Fort Worth: Harcourt Brace Jovanovich, 1993.

Gitlin, T. "The Postmodern Predicament." *Wilson Quarterly* 13 (1989): 67-76.

The Unity of Philosophical Experience. New York: Charles Scribner's Sons, 1947.

Gladson, Jerry. "Taming Historical Criticism: Adventist Biblical Scholarship in the Land of the Giants." *Spectrum* 18 (April 1988): 19-34.

Glenn, Alfred Anthony. *The Relationship Between Theology as a Special Science and Analytic Philosophy with Special Reference to the Theology of Karl Barth: A Dissertation.* Ann Arbor, MI: University Microfilms, 1967.

Glynn, Patrick. *God: The Evidence: The Reconciliation of Faith and Reason in a Post-secular World.* Rocklin, CA: Prima Pub., 1997.

Godsey, John D. "Review of *Naming the Whirlwind.*" *The Christian Century* 87, no. 23 (10 June 1970): 729.

Goetz, Stephen G. "Models in Theology and Science: Toward a New Theology of Creation." M.A. thesis, Graduate Theological Union, 1985.

Gogarten, Friedrich. "The Intellectual Situation of the Theologian: Another Answer to Paul Tillich." In *The Beginnings of Dialectical Theology,* ed. James M. Robinsion, 159-162. Richmond, VA: John Knox Press, 1962.

Gonzalez, Justo L. *Christian Thought Revisited.* Nashville: Abingdon Press, 1989.

Goot, Henry Vander. "From Illusion to Restriction: A Critical Response to Theistic Evolution." Grand Rapids, MI: Calvin College, 1989.

_____, ed. *Creation and Method: Critical Essays on Christocentric Theology*. Washington, DC: University Press of America, 1981.

Gregersen, Niels Henrik, ed. *The Concept of Nature in Science and Theology*. Geneva, Switzerland: Labor et Fides, 1997.

Greidanus, Sidney. *"Sola Scriptura": Problems and Principles in Preaching Historical Texts*. Toronto: Wedge Publishing Foundation, 1970.

Greene, John C. *Darwin and the Modern World View*. Baton Rouge: Louisiana State University Press, 1973.

Grene, Margorie, ed. *Dimensions of Darwinism: Themes and Counter Themes in Twentieth-Century Evolutionary Theory*. Cambridge: Cambridge University Press, 1983.

Grenz, Stanley and Roger Olson. *20th Century Theology: God and the World in a Transitional Age*. Downers Grove, IL: InterVarsity Press, 1992.

Grey, Bryan. "Theology as Science: An Examination of the Theological Methodology of Thomas F. Torrance." S.T.D. thesis, Katholieke Universiteit Te Leuven, 1975.

Griffin, David Ray. *God and Religion in the Postmodern World: Essays in Postmodern Theology*. Albany, NY: State University of New York Press, 1989.

_____. "Green Spirituality: A Postmodern Convergence of Science and Religion." *Journal of Theology (United Theological Seminary)* 96 (1992): 5-20.

_____. "Introduction." In *Varieties of Postmodern Theology*, ed. David Griffin, William Beardslee, and Joe Holland. Albany, NY: State University of New York Press, 1989.

"Introduction to SUNY Series in Constructive Postmodern Thought." In *Founders of Constructive Postmodern Philosophy*, ed. David Griffin et al. Albany, NY: State University of New York Press, 1993.

_____. "On Ian Barbour's Issues in Science and Religion." *Zygon* 23 (1988): 57-81.

_____. "Postmodern Theology for the Church." *Lexington Theological Quarterly* 28, no. 3 (1993): 201-60.

_____. *Sacred Interconnections: Postmodern Spirituality, Political Economy and Art*. Albany, NY: State University of New York Press, 1990.

_____, ed. *Physics and the Ultimate Significance of Time*. Albany, NY: SUNY, 1986.

_____, ed. *The Reenchantment of Science: Postmodern Proposals*. Albany, NY: SUNY, 1988.

_____, ed. *Spirituality and Society: Postmodern Visions*. Albany, NY: State University of New York Press, 1988.

Griffin, David Ray, and Joseph C. Hough, eds. *Theology and the University: Essays in Honor of John B. Cobb, Jr.* Albany, NY: State University of New York Press, 1991.

Griffin, David Ray, and Huston Smith. *Primordial Truth and Postmodern Theology*. Albany, NY: State University of New York Press, 1989.

Griffin, David Ray, et al., eds. *Founders of Constructive Postmodern Philosophy*. New York: State University of New York Press, 1993.

Grof, Stanislav. *The Holotropic Mind: The Three Levels of Human Consciousness and How They Shape Our Lives*. New York: HarperCollins Publishers, 1993.

Gross, Don Paul. "Theological Method and the Research Programme of Imre Lakatos." M.A. thesis, Trinity Evangelical Divinity School, 1992.

Grove, J. W. "The Intellectual Revolt Against Science." *The Skeptical Inquirer* 13 (Fall 1988): 70-75.

Guarino, Thomas. "Revelation and Foundationalism: Toward Hermeneutical and Ontological Appropriateness." *Modern Theology* 6, no. 3 (April 1990): 221-235.

Gulley, Norman. "The Influence of Philosophical and Scientific World Views on the Development of Theology." *Journal of the Adventist Theological Society* 4 (1993): 137-160.

Gunton, Colin. *The One, the Three and the Many.* Cambridge: Cambridge University Press, 1993.

Gustafson, Bengt. "The Current Scientific World View." In *The New Faith-Science Debate: Probing Cosmology, Technology and Theology,* ed. John M. Mangum. Minneapolis: Fortress Press, 1989.

Gustafson, James M. *Intersections: Science, Theology, and Ethics.* Cleveland, OH: Pilgrim Press, 1996.

Guy, Fritz. "Negotiating the Creation-Evolution Wars." *Spectrum* 20, no. 1 (1989): 40-45.

_____. "Contemporary Adventism and the Crisis of Belief." *Spectrum* (1972): 19-27.

Hackmann, Daniel Winthrop. "Validation and Truth: Wolfhart Pannenberg and the Scientific Status of Theology." Ph.D. diss., University of Iowa, 1989.

Hagen, J. G. "Science and the Church." *The Catholic Encyclopedia.* Edited by Charles G. Herbermann et al. New York: Robert Appleton, 1912, 13:508-609.

Hall, Norman F., and Lucia Hall. "Is the War between Science and Religion Over?" *The Humanist* 46, no. 3 (May-June 1986): 26.

Hall, Donald E. "The Whole Truth, II: Thoughts on the Scientific Attitude." *Spectrum* (1971): 71-80.

Halvorson, Loren E. "Dialogue Out of Context?" *Dialogue* 3, no. 4 (Fall 1964): 248-249.

Hammill, Richard. "Fifty Years of Creationism: The Story of an Insider." *Spectrum* 15, no. 2 (1984): 11, 33-45.

Hanna, Martin. *The Cosmic Christ of Scripture: How to Read God's Three Books*. Northern Caribbean University Press, to be published in 2004).

_____. "The Divine-Human Christ: Unveiling Divinity in Humanity." *Issues in Theology and Spiritual Leadership* 2, no. 1 (2000): 19-40.

_____. "The Harmonious Development of Faith and Learning at Northern Caribbean University." *Issues in Theology and Spiritual Leadership* 3, no. 1 (2001): 67-103.

_____. "The Pre-Advent Explosion of Knowledge: Scripture Authority and Plural Revelations." *Issues in Theology and Spiritual Leadership* 1, no. 1 (1999): 11-35.

_____. "Review of *Christian Apologetics in a Postmodern World*, by Timothy R. Phillips." *Andrews University Seminary Studies* 37 (Spring 1999): 140-142.

_____. "Review of *Reported Miracles: A Critique of Hume*, by Joseph Houston." *Andrews University Seminary Studies* 36 (Autumn 1998): 293-294.

_____. "Review of *The Creation-Evolution Debates*, by Ronald L. Numbers." *Andrews University Seminary Studies* 36 (Autumn 1998): 301-303.

_____. "Review of *Nature, Reality and the Sacred: The Nexus of Science and Religion*, by Langdon Gilkey." *Andrews University Seminary Studies* 33 (Autumn 1995): 300-302.

_____. "Review of *The Myth of Religious Neutrality: An Essay on the Hidden Role of Religious Beliefs in Theories*, by Roy A. Clouser." *Andrews University Seminary Studies* 32 (Spring-Summer 1992): 121-123.

_____. "Science and Theology: Focusing the Complementary Lights of Jesus, Scripture and Nature." *Journal of the Adventist Theological Society* 6, no. 2 (1995): 6-51.

_____. "Science and Theology." In *Creation, Catastrophe, and Calvary: Why a Global Flood Is Vital to the Atonement*, ed. John Templeton Baldwin, 172-208. Hagerstown, MD: Review and Herald, 2000.

_____. "The Servant-Master Roles of the Laws of Jesus, Scripture and Nature." *Journal of the Adventist Theological Society* 9, no. 1-2 (1998-2000): 280-311.

Hanson, Paul D. *Dynamic Transcendence: The Correlation of Confessional Heritage and Contemporary Experience in a Biblical Model of Divine Activity*. Philadelphia: Fortress Press, 1978.

Hara, Masakazu. "Critical Realism in Philosophy of Science and Its Relevance to Theology." S.T.M. thesis, Yale Divinity School, 1989.

Harben, Timothy J. "How Pascal's and Descartes' Understandings of Natural Science Can Shed Light on the Contemporary Debate Between Science and Theology." M.T.S. thesis, Emory University, 1992.

Harder, F. E. J. "Beyond Arithmetic: The Truth of Creation." *Spectrum* 15, no. 1 (1984): 54-59.

_____. "Revelation as a Source of Knowledge as Conceived by Ellen G. White." Ph.D. diss., New York University, 1960.

Haddorff, David W. "Langdon Gilkey's Method of Correlation: Modern Historical Experience and a Theological Interpretation of History." M.A. thesis, Wheaton College, 1984.

Hare, P.E. "Geologic Time: The Scientific Evidence and the Genesis Record." *Spectrum* 10, no. 1 (1979): 12-19.

Harink, Douglas Karel. "Theology as Science: An Exposition and Evaluation of the Thought of Thomas Forsyth Torrance." M.C.S. thesis, Regent College, 1979.

Harmon, Willis. *Global Mind Change: The Promise of the Last Years of the Twentieth Century*. Boston: Sigo Press, 1991.

Harris, Errol E. *Formal, Transcendental and Dialectical Thinking: Logic and Reality*. Albany, NY: State University of New York Press, 1987.

Harrisville, Roy A., and Walter Sundberg. *The Bible in Modern Culture: Theology and Historical-Critical Method from Spinoza to Käsemann*. Grand Rapids, MI: Eerdmans, 1995.

Hartshorne, Charles. *Man's Vision of God and the Logic of Theism*. Hamden, CT: Archon Books, 1964.

Hartt, Julian Norris. *Theological Method and Imagination*. New York: Seabury Press, 1977.

Hartwig, Mark. "How Creation Happened." *Moody* (May 1995): 20-23.

_____. "Challenging Darwin's Myth." *Moody* (May 1995): 15-19.

Harvey, David. *The Condition of Postmodernity: An Enquiry into the Origins of Cultural Change*. Oxford: Blackwell, 1990.

Hasel, Gerhard. "The Polemic Nature of the Genesis Cosmology." *The Evangelical Quarterly* 46 (1974): 81-102.

_____. *An Analysis of Modern Methods of Biblical Interpretation and Proposals for the Interpretation of the Bible as the Word of God*. Lincoln, NE: College View Printers, 1985.

_____. "The Origin of the Biblical Sabbath and the Historical-Critical Method: A Methodological Test Case." *Journal of the Adventist Theological Society* 4, no. 1 (Spring 1993): 17-46.

_____. *Understanding the Living Word of God*. Mountain View, CA: Pacific Press, 1980.

Haselden, Kyle, comp. *Changing Man: The Threat and the Promise: Five Scientists and Five Theologians on Christian Faith and Evolutionary Thought*. Garden City, NY: Doubleday, 1968.

Hasker, William. "Mr. Johnson for the Prosecution." *Christian Scholar's Review* 22, no. 2 (1993): 177-186.

_____. "Faith-learning Integration: An Overview." *Christian Scholar's Review* 21, no. 3 (1992): 234-248.

Haught, John, and D. M. Yeager. "Polanyi's Finalism." *Zygon* 32 (December 1997): 543-566.

Hausmann, William John. *Science and the Bible in Lutheran Theology: From Luther to the Missouri Synod.* Washington, DC: University Press of America, 1978.

Haughton, J.T. *The Search for God: Can Science Help*? Oxford: Lion, 1995.

Hawking, Stephen. *A Brief History of Time.* New York: Bantam, 1988.

Hawthorne, J. N. "Scientific Fraud and Christian Ethics." *Science and Christian Belief* 5 (1993): 37-45.

_____. *Windows on Science and Faith.* Leicester: IVP, 1986.

Hayes, Michael. *The Infinite Harmony: Musical Structures in Science and Theology.* London: Weidenfeld and Nicolson, 1994.

Hayward, James L. "Adventist Creationism: Facing the Nonpeaceable Kingdom." *Spectrum* 21, no. 2 (1991): 23-33.

_____. "Theology and Science Approach the Third Millennium: A Review Essay." *Perspectives in Religious Studies* 22, no. 1 (Spring 1995): 65-73.

_____. *The Human Factor: Evolution, Culture, and Religion.* Minneapolis: Fortress Press, 1993.

_____, ed. *The Scope of Grace: Essays on Nature and Grace in Honor of Joseph Sittler.* Philadelphia: Fortress Press, 1964.

Hazelton, Roger. "Relocating Transcendence." *Union Seminary Quarterly Review* 30 (Winter-Summer 1975): 101-109.

Hefner, Philip. "Theology and Science Approach the Third Millennium: A Review Essay." *Perspectives in Religious Studies* 22, no. 1 (Spring 1995): 65-73.

Hegel, G. *Lectures on the Philosophy of Religion: Together with a Work on the Proofs of the Existence of God.* Translated by E. Spiers and J. Sanderson. London: Routledge and Kegan, 1962.

Heisenberg, Werner. *Physics and Beyond.* Translated by A. J. Pomerans. New York: Harper Torchbooks, 1957.

Heller, Michal. *The New Physics and a New Theology.* Notre Dame, IN: University of Notre Dame Press, 1996.

_____. *The World and the Word—Between Science and Religion.* Tucson: Pachart, 1986.

_____. "Scientific Rationality and the Christian Logos." In *Physics, Philosophy and Theology: A Common Quest for Understanding,* ed. Robert Russell, William Stoeger and George Coyne, 141-150. Vatican City: Vatican Observatory, 1988.

Hendry, George Stuart. *Theology of Nature.* Princeton, NJ: Princeton Theological Seminary, 1978.

Henry, Carl. *God, Revelation and Authority.* 3 vols. Waco, TX: Word, 1976-79.

Herberg, Will. "Biblical Realism as a Norm." In *Colleges and Commitments.* Philadelphia: Westminster Press, 1971.

Hermann, Kenneth W. "Innocent as Doves, But Not Wise as Serpents: Nineteenth Century Evangelicals and Evolution." *Pro Rege* 19, no. 1 (September 1990): 1-11.

Herr, Larry G. "Genesis One in Historical-Critical Perspective." *Spectrum* 13, no. 2 (1982): 51-62.

Herrmann, Eberhard. *Scientific Theory and Religious Belief: An Essay on the Rationality of Views of Life.* Kampen, The Netherlands: Kok Pharos Pub. House, 1995.

Herzog, Frederick Ludwig. "The Possibility of Theological Understanding: An Inquiry into the Presuppositions of Hermeneutics in Theology." Th.D. diss., Princeton Theological Seminary, 1953.

Hesse, Mary B. "Reductionism in the Sciences." In *Reductionism in Academic Disciplines*, ed. Arthur R. Peacocke, 105-12. Guilford: Society for Research into Higher Education, 1985.

_____. *The Structure of Scientific Inference*. London: Macmillan, 1974.

Hesselink, John. "The Life and Work of Professor Thomas F. Torrance." *Reformed Review* 38, no. 1 (Autumn 1984): 47-64.

Hetherington, Stephen Cade. *Epistemology's Paradox: Is a Theory of Knowledge Possible?* Savage, MD: Rowman and Littlefield Publishers, 1992.

Hiebert, Theodore. "Re-Imaging Nature: Shifts in Biblical Interpretation." *Interpretation* 50 (January 1996): 36-46.

Himmelfarb, Gertrude. "The Christian University: A Call to Counterrevolution." *First Things*, January 1996, 16-19.

Hinlicky, Paul R. "The Human Predicament in Emergent Post-Modernity." *Dialog* 23, no. 3 (1984): 167-173.

Hinze, Bradford E. "The Notion of Symbol and Its Usage in the Writings of Langdon Gilkey from 1959-1977." M.A. thesis, Catholic University of America, 1978.

Hodge, Charles. *Systematic Theology*. New York: Scribners, 1872-3.

_____. *What Is Darwinism? and Other Writings on Science and Religion*. Grand Rapids, MI: Baker Book House, 1994.

Hodgson, Peter C. "Review of *Theology and the Philosophy of Science*." *Religious Studies Review* 3 (1977): 216.

Hodgson, Peter Edward. *The Implications of Quantum Physics*. Farmington Institute for Christian Studies, 1984.

Holder, R. *Nothing but Atoms and Molecules*. Tunbridge: Monarch, 1993.

Holmes, Arthur. *Faith Seeks Understanding*. Grand Rapids, MI: Eerdmans, 1971.

_____. *All Truth Is God's Truth*. Grand Rapids, MI: Eerdmans, 1977.

_____. *Christian Philosophy in the Twentieth Century*. Nutley, NJ: Craig, 1969.

Holton, Gerald. "The Antiscience Problem." *Skeptical Inquirer* 18 (1994): 264-265.

Hooykaas, Reijer. "The Christian Approach in Teaching Science." *Science and Christian Belief* 6, no. 2 (October 1994): 113-128.

_____. *Religion and the Rise of Modern Science*. Edinburgh: Scottish Academic Press, 1972.

Hopper, Jerry. *Understanding Modern Theology: Cultural Revolutions and New Worlds*. Philadelphia: Fortress Press, 1987.

Horton, Walter Marshal. *Realistic Theology*. New York: Harper and Brothers, 1934.

Horvath, Tibor. *Jesus Christ as Ultimate Reality and Meaning*. Ontario, Canada: URAM, 1994.

_____. *Eternity and Eternal Life: Speculative Theology and Science in Discourse*. Waterloo, Ontario: Wilfrid Laurier University Press, 1993.

Howe, Frederic R. "The Age of the Earth: An Appraisal of Some Current Evangelical Positions, Part 1." *Bibliotheca Sacra* 142, no. 565 (January-March 1985): 23-37.

_____. "The Age of the Earth: An Appraisal of Some Current Evangelical Positions, Part 2." *Bibliotheca Sacra* 142, no. 566 (April-June 1985): 114-129.

Hubbeling, H. G. *Language, Logic and Criterion.* Amsterdam: Born N.V., 1971.

Hume, David. *Dialogues Concerning Natural Religion.* Edited by N. Smith. Oxford: Clarendon Press, 1935.

Hunt, John. *Pantheism and Christianity.* New York: Kennikat Press, 1884.

Hyde, Gordon M., ed. *A Symposium on Biblical Hermeneutics.* Biblical Research Committee, General Conference of SDAs Washington DC: Review and Herald, 1974.

Inbody, Tyron. "Myth in Contemporary Theology: The Irreconcilable Issue." *Anglican Theological Review* 58 (April 1976): 139-57.

Indinopulos, Thomas A. *The Erosion of Faith: An Inquiry into the Origin of the Contemporary Crisis in Religious Thought.* Chicago: Quadrangle Books, 1971.

Ingraffia, Brian D. *Postmodern Theory and Biblical Theology: Vanquishing God's Shadow.* Cambridge, UK: Cambridge University Press, 1995.

Jacob, Margaret C. *The Newtonians and the English Revolution.* Hassocks: Harvester Press, 1976.

Jaki, Stanley I. *The Road of Science and the Ways to God.* Chicago: University of Chicago Press, 1978.

_____. *God and the Cosmologists.* Edinburgh: Scottish Academic Press, 1989.

_____. *The Savior of Science.* Edinburgh: Scottish Academic Press, 1990.

Jantzen, Grace. *God's World, God's Body.* Philadelphia: Westminster Press, 1984.

_____. "Sources of Religious Knowledge." *Literature and Theology* 10 (1996): 91-111.

Jencks, Charles. *Postmodernism.* New York: Rizzoli, 1987.

Johnson, Benton. "Taking Stock: Reflections on the End of Another Era." *Journal for the Scientific Study of Religion* 21, no. 3 (1982): 189-200.

Johnson, Delmer A. "By the Campfire: Red Giants, White Dwarfs, Black Holes--and God." *Spectrum* 20, no. 1 (1989): 29-39.

Johnson, Phillip E. *Darwin On Trial*. Washington, DC: Regnery Gateway, 1991.

_____. *Reason in the Balance: The Case Against Naturalism in Science, Law, and Education*. Downer's Grows, IL: InterVarsity Press, 1995.

Johnson, William Stacy. *The Mystery of God: Karl Barth and the Postmodern Foundations of Theology*. Louisville, KY: Westminster John Knox Press, 1997.

Jones, Gareth. *Critical Theology: Questions of Truth and Method*. New York: Paragon, 1995.

Jones, Lewis. "The Two Cultures: A Resurrection." *The Skeptical Inquirer* 14 (Fall 1989): 57-64.

Jongeneel, J. A. B. *Philosophy, Science, and Theology of Mission in the 19th and 20th Centuries: A Missiological Encyclopedia*. New York: P. Lang, 1995.

Kaiser, Walter C. "The Nature and Criteria of Theological Scholarship: An Evangelical Critique and Plan." *Theological Education* 32, no. 1 (Autumn 1995): 57-70.

Kaiser, Christopher. *Creation and the History of Science*. Grand Rapids, MI: Eerdmans, 1991.

_____. "Christology and Complementarity." *Religious Studies* 12 (1976): 37-48.

_____. "The Logic of Complementarity in Science and Theology." Ph.D. thesis, University of Edinburgh, 1974.

_____. *Creational Theology and the History of Physical Science: The Creationist Tradition from Basil to Bohr*. New York: Brill, 1997.

Kallas, Endel. "Theology and Science: Historical and Contemporary Perspectivies." M.A. thesis, Graduate Theological Union, 1972.

Kalthoff, Mark. "God and Creation: An Historical Look at Encounters Between Christianity and Science." In *Man and Creation: Perspectives on Science and Theology.* Hillsdale, MI: Hillsdale College Press, 1993.

Kane, G. Stanley. "God-Language and Secular Experience." *International Journal for Philosophy of Religion* 2 (Spring 1971): 78-98.

Kant, Immanuel. *Critique of Pure Reason.* Translated by N. K. Smith. London: Macmillan, 1933.

_____. *Reason within the Limits of Reason Alone.* New York: Harper and Row, 1960.

Kaufman, G. D. "Nature, History and God: Toward an Integrated Conceptualization." *Zygon* 27 (1992): 379-401.

Kaufman, Gordon. *Theology for a Nuclear Age.* Philadelphia: Westminister, 1985.

Knox, Ian P. *Above or Within*? Mishawaka, IN: Religious Education Press, 1976.

Keck, Leander E. "The Premodern Bible in the Postmodern World." *Interpretation* 50, no. 2 (April 1996): 130-141.

Keiser, Melvin R. "Beginning Where We Are: The Post Critical Starting Point of Systematic Theology." *Religion and Intellectual Life* 5 (1988): 75-92.

Keller, Evelyn Fox. *A Feeling for the Organism.* San Francisco: Freeman, 1983.

Kellner, Hans. *Language and Historical Representation.* Madison: University of Wisconsin Press, 1989.

Kelsey, David H. *The Uses of Scripture in Recent Theology.* Philadelphia: Fortress Press, 1975.

Kemmler, Dieter Werner. *Faith and Human Reason: A Study of Paul's Method of Preaching as Illustrated by 1-2 Thessalonians and Acts 17, 2-4.* Leiden: E. J. Brill, 1975.

Kierkegaard, Soren. *Philosophical Fragments or a Fragment of Philosophy.* Translated by D. Swenson. Princeton, NJ: Princeton University Press, 1936.

King, Robert H. "Introduction: The Task of Theology." In *Christian Theology: An Introduction to Its Traditions and Tasks,* ed. Peter Hodgson and Robert King. Philadelphia: Fortress Press, 1985.

Klaaren, Eugene M. *The Religious Origins of Modern Science.* Grand Rapids, MI: Eerdmans, 1977.

Klinefelter, Donald S. "God and Rationality: A Critique of the Theology of Thomas F. Torrance." *The Journal of Religion* 53 (1973): 117-135.

Klink, William. "Nature, Technology, and Theology." *Zygon* 26 (1991): 203-210.

Knierim, Rolf. "Science in the Bible." *Word and World* 13, no. 3 (Summer 1993): 242-255.

Knox, Crawford. *Changing Christian Paradigms and Their Implications for Modern Thought.* Leiden: E. J. Brill, 1993.

Korsmeyer, Jerry D. *God-Creature-Revelation: A Neoclassical Framework for Fundamental Theology.* Lanham, MD: University Press of America, 1995.

Kroker, Arthur. *Panic Encyclopedia: The Definitive Guide to the Postmodern Scene.* New York: St. Martin's Press, 1989.

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 in the Spirit." *Scottish Journal of Theology* 43, no. 3 (1990): 366-389.

Kuhn, Thomas. *The Structure of Scientific Revolutions.* 2d ed. Chicago: University of Chicago Press, 1970.

_____. "On the Relationship of Theology to Science." In *Religion and the Natural Sciences: The Range of Engagement*, ed. James E. Huchingson, 57-60. Fort Worth: Harcourt Brace Jovanovich, 1993.

Küng, Hans. *Christianity: Essence, History and Future*. New York: Continuum, 1996.

_____. "Karl Barth and the Postmodern Paradigm." *The Princeton Seminary Bulletin* 9 (1988): 8-31.

_____. "Paradigm Change in Theology." In *The Whirlwind in Culture*, ed. Donald Musser and Joseph Price. Bloomington, IN: Meyer Stone, 1988.

Küng, Hans, and David Tracy, eds. *Paradigm Change in Theology: A Symposium for the Future*. Translated by Margaret Köhl. New York: Crossroad, 1991.

Kurtz, Paul. "The Growth of Antiscience." *Skeptical Inquirer* 18 (Spring 1994): 255-263.

Kuyper, Abraham. *Principles of Sacred Theology*. Grand Rapids, MI: Eerdmans, 1954.

Ladrière, Jean. "On the Notion of Criterion." In *Is Being Human a Criterion of Being Christian*? ed. Jean-Pierre Jossua and Claude Geffré, 10-15. New York: Seabury Press, 1982.

_____. *Language and Belief*. Notre Dame, IN: University of Notre Dame Press, 1972.

Laferriére, Joseph E. "Certainty and Proof in Creationist Thought." *The Skeptical Inquirer* 13 (Winter 1989): 185-188.

La Follette, Marcel Chotkowski, ed. *Creationism, Science, and the Law: The Arkansas Case*. Cambridge, MA: MIT Press, 1983.

Laird, John. *Theism and Cosmology*. London: George Allen and Unwin, 1940.

Lakatos, Imre. *Mathematics, Science and Epistemology*. Cambridge: Cambridge University Press, 1978.

Lakatos, I., and A. Musgrave. *Criticism and the Growth of Knowledge*. Cambridge, England: Cambridge University Press, 1970.

Lakeland, Paul. *Theology and Critical Theory: The Discourse of the Church*. Nashville: Abingdon Press, 1990.

Landa, Judah. *Torah and Science*. Hoboken, NJ: Ktav Publishing House, 1991.

Lane, Anthony N. S. "Sola Scripture? Making Sense of a Post-Reformation Slogan." In *A Pathway into the Holy Scripture*, ed. P. E. Satterthwaite and D. F. Wright, 297-327. Grand Rapids, MI: Eerdmans, 1994.

Lane, David H. "Theological Problems with Theistic Evolution." *Bibliotheca Sacra* 150 (April-June 1994): 155-174.

_____. "Special Creation or Evolution: No Middle Ground." *Bibliotheca Sacra* 151 (January-March 1994): 11-31.

Langford, Thomas. "A Critical Analysis of Paul Tillich's Method of Correlation." Ph.D. diss., Duke University, 1958.

_____. "T. F. Torrance's *Theological Science*: A Reaction." *Scottish Journal of Theology*, 25, no. 2 (1972): 155-170.

Lanson, Duane Howard. "The Temporality of the Trinity: A Christian Theological Concept of Time and Eternity in View of Contemporary Physical Theory." Ph.D. diss., Graduate Theological Union, 1993.

Latourelle, René, and Gerald O'Collins, eds. *Problems and Perspectives of Fundamental Theology*. New York: Paulist Press, 1982.

Laudan, Larry. "Progress or Rationality? The Prospects for Normative Naturalism." *American Philosophical Quarterly* 24 (1987): 19-31.

Lazich, Daniel. "How Science Discovered God." *Ministry* (1989): 26-28.

Leichty, D. *Theology in Postliberal Perspective.* Philadelphia: SCM Press, 1990.

Levenson, Jon D. "The Bible: Unexamined Commitments of Criticism." *First Things* (February 1993): 24-33.

Levin, David M. *The Opening of Vision: Nihilism and the Postmodern Situation.* New York: Routledge, 1988.

Lewis, Gordon R. *Testing Christianity's Truth Claims: Approaches to Christian Apologetics.* Chicago: Moody Press, 1976.

Lewis, Larry M. "Perspective and Tension with Faith and Reason." *Spectrum* 1, no. 2 (1974): 77-86.

Liben, Paul H. "Science Within the Limits of Truth." *Perspectives on Science and Christian Faith* 44, no. 3 (September 1992): 162-168.

Lilje, Hanns. *Modern Science and the Christian Encounter.* Madison, WI: Wisconsin Lutheran Student Foundation, 1962.

Lindbeck, George. *The Nature of Doctrine: Religion and Theology in a Postliberal Age.* Philadelphia: Westminster Press, 1984.

Lindberg, David C., and Ronald L. Numbers. "Beyond War and Peace: A Reappraisal of the Encounter between Christianity and Science." *Church History* 55 (1986): 338-354.

_____, eds. *God and Nature: Historical Essays on the Encounter between Christianity and Science.* Berkley: University of California Press, 1986.

Linnemann, Eta. *Historical Criticism and the Bible: Methodology or Ideology.* Grand Rapids, MI: Baker, 1990.

_____. "Historical-Critical and Evangelical Theology." *JATS* 5, no. 2 (Autumn 1994): 19-36.

Lints, Richard. "The Postpositivist Choice: Tracy or Lindbeck?" *Journal of the American Academy of Religion* 61, no. 4 (1993): 655-677.

Littlejohn, Ronnie Lynn. "An Analysis of Langdon Gilkey's Phenomenology of Ultimacy and Its Implications for Theology and Ethics." Ph.D. diss., Baylor University, 1978.

Livingston, James. *Modern Christian Thought: From the Enlightenment to Vatican II.* New York: Macmillan Publishing Co., 1958.

Livingstone, David N. "Evangelicals and Evolution: Retrospect and Prospect." *Pro Rege* 19, no. 1 (1990): 12-23.

Locke, John. *An Essay in Human Understanding.* Oxford: Clarendon Press, 1979.

Lockerbie, D. Bruce. "Thinking Like a Christian, Pt. 1: The Starting Point." *Bibliotheca Sacra* 143 (1986): 3-13.

Lonergan, Bernard J. F. *Method in Theology.* London: Darton, Longman and Todd, 1971.

_____. "Second Lecture: Religious Knowledge." In *A Third Collection, Papers by Bernard Lonergan, S.J.,* ed. Frederick E. Crowe, S.J. New York: Paulist Press, 1985.

Lönning, Per. *The Dilemma of Contemporary Theology.* New York: Humanities Press, 1962.

Losee, John P. "Biblical Religion and Ontology: Has Tillich Established a Point of Identity?" *The Journal of Bible and Religion* 33 (July 1965): 223-228.

Lucas, Ernest. "Scientific Truth and New Age Thinking." *Science and Christian Belief* 4 (1992): 13-25.

Lugenbeal, Edward. "The Conservative Restoration at Geoscience." *Spectrum* 15, no. 2 (1984): 23-31.

Lukacs, John. *The Passing of the Modern Age.* New York: Harper and Row, 1970.

Lundin, Roger. *The Culture of Interpretation: Christian Faith and the Postmodern World.* Grand Rapids, MI: Eerdmans, 1993.

_____, ed. Introduction to *Discliplining Hermeneutics: Interpretation in Christian Perspective*. Grand Rapids, MI: Eerdmans, 1997.

Luther, Martin. "Heidelberg Disputation of 1518." In *Luther's Works*, ed. Helmut T. Lehmann and trans. Harold J. Grimm. Vol. 31. Philadelphia: Muhlenberg Press, 1957.

_____. *Selections from His Writings*. Edited by John Dillenberger. Garden City, NY: Anchor Books, 1961.

_____. "Sermons on the Gospel of St. John Chapters 1-4." In *Luther's Works*, ed. Jaroslav Pelikan. Vol. 22. Saint Louis, MO: Concordia Publishing house, 1957.

_____. *The Table Talk or Familiar Discourse*. Translated by W. Hazlitt. London: David Bogue, 1948.

_____. *Werke*, Weimar: Ausgabe, 1883.

Lutheran Research Forum. *Theology and Science: Essays Presented at Lutheran Research Forum*. Tacoma, WA: Lutheran Research Forum, 1973.

Lyon, David. "Valuing in Social Science: Post-empiricism and Christian Responses." *Christian Scholars Review* 12 (1983): 324-338.

Lyotard, Jean-François. *The Postmodern Condition*. Translated by Geoff Bennington and Brian Massumi. Vol. 10, *Theory and History of Literature*. Minneapolis: University of Minnesota Press, 1984.

MacKay, D. M. "'Complementarity' in Scientific and Theological Thinking." *Zygon* 9, no. 3 (September 1974): 225-244.

Mackinnon, Edward. *Motion, Mechanics and Theology*. New York: Fordham University Press, 1961.

Macquarie, John. *Principles of Theology*. New York: Scribner, 1966.

_____. *Twentieth Century Religious Thought*. Philadelphia: Trinity Press International, 1989.

Maier, Gerhard. *Biblical Hermeneutics*. Wheaton, IL: Crossway Books, 1994.

Maly, Eugene H. "The Interplay of World and Worship in the Scriptures." In *Liturgy in Transition, Concilium* 62, ed. Herman Schmidt, 30-39. New York: Herder and Herder, 1971.

Mangum, John M. *The New Faith-Science Debate: Probing Cosmology, Technology and Theology*. Minneapolis: Augsburg Fortress Press, and Geneva: World Council of Churches Publications, 1989.

Marcum, James. "Man as Priest of Creation: An Analysis and Critique of Torrance Torrance's New Synthesis Between Science and Theology." M.A. thesis, Gordon Cornwall Seminary, 1982.

Marshal, I. Howard. "To Find Out What God Is Saying: Reflections on the Authorizing of Scripture." In *Disciplining Hermeneutics*, ed. Roger Lundin. Grand Rapids, MI: Eerdmans, 1997.

Martin, James P. "Toward a Post-Critical Paradigm." *New Testament Studies* 33 (1987): 370-385.

Martin, Robert Keith. "The Incarnate Ground of Christian Education: The Integration of Epistemology and Ontology in the Thought of Michael Polanyi and Thomas F. Torrance." Ph.D. diss., Princeton Theological Seminary, 1995.

Marty, Martin E., and R. Scott Appleby. "Introduction: A Sacred Cosmos, Scandalous Code, Defiant Society." In *Fundamentalisms and Society*, ed. Martin E. Marty and R. Scott Appleby. Chicago: University of Chicago Press, 1993.

Mascal, Eric. "The Scientific Outlook and the Christian Message." *Concilium, Church and World* 6, no. 3 (June 1967): 60-63.

Mason, David R. "Gilkey on 'God and the World': An Appraisal." *American Journal of Theology and Philosophy* 16, no. 3 (September 1995): 315-334.

Maximus *Capita 200 theologica et oeconomica Maximus Confessor. Selected Writings*, ed. G. Berthold. New York: SPCK, 1985.

_____ *Quaestiones ad Thalassium Corpus Christianorum. Series Graeca* 7. Louvain: Brepols University Press, 1980.

May, Hal, and James G. Lesniak, eds. *Contemporary Authors*, vol. 29. Detroit, MI: Gale Research Co., 1990.

Mazzeo, Joseph Anthony. *Varieties of Interpretation*. Notre Dame: University of Notre Dame Press, 1978.

McClendon, William, Jr., and Nancey Murphy. "Distinguishing Modern and Postmodern Theologies." *Modern Theology* 5 (April 1989): 191-214.

McFague, Sallie. *Metaphorical Theology: Models of God in Religious Language*. Philadelphia: Fortress Press, 1982.

_____. *Models of God: Theology for an Ecological Nuclear Age*. Philadelphia: Fortress Press, 1987.

McGrath, Alister E. *The Science of Religion*. Basingstoke: Marshall Pickering, 1986.

_____. *Thomas F. Torrance: An Intellectual Biography*. Edinburgh: T & T Clark, 1999.

McIntyre, Alasdair. *Whose Justice? Which Rationality?* South Bend, IN: University of Notre Dame Press, 1988.

McKnight, Edgar V. *Postmodern Use of the Bible: The Emergence of Reader-oriented Criticism*. Nashville, TN: Abingdon Press, 1988.

McLachlan, H., ed. *Sir Isaac Newton: Theological Manuscripts*. Liverpool: H. McLachlan, 1950.

McLain, F. Michael. "On Theological Models." *Harvard Theological Review* 62 (1969): 155-187.

McMullin, Ernan. "How Should Cosmology Relate to Theology." In *The Sciences and Theology in the Twentieth Century,* ed. Arthur Peacocke. Notre Dame: University of Notre Dame Press, 1981.

_____. "Introduction: Evolution and Creation." In *Evolution and Creation,* ed. Ernan McMullin. Notre Dame: University of Notre Dame Press, 1985.

_____. "Natural Science and Belief in a Creator." In *Religion, Science and the Search for Wisdom,* ed. David Byers. Washington, DC: National Conference of Catholic Bishops, 1987.

_____. "Natural Science and Christian Theology." In *Religion, Science, and the Search for Wisdom,* ed. David Byers. Washington, DC: National Council of Catholic Bishops, 1987.

Mcquilkin, Robertson, and Bradford Mullen. "The Impact of Postmodern Thinking on Evangelical Hermeneutics." *Journal of the Evangelical Theological Society* 40 (1997): 69-82.

Medawar, Peter. *The Limits of Science.* New York: Oxford University Press, 1984.

Meer, Jiste M. van der, ed. *Facets of Faith and Science.* Lanham, MD: University Press of America, 1996.

Meister, Chad V. "Science and Theology: On Formulating a Critical Realist Model of Integration." M.A. thesis, Trinity Evangelical Divinity School, 1993.

Melanchthon, Philipp. *Corpus Reformatorum, Philippi Melanchthonis opera, quae supersunt omnia.* Edited by C. G. Bretschneider and H. E. Bindsell. Halis Saxonium, 1834-60.

_____. *Loci communes theologici.* 1521 ed. Translated and edited by Wilhelm Pauk. *The Library of Christian Classics,* vol. 19. Philadelphia: Westminster Press, 1953-.

Meland, Bernard E. "How Is Culture a Source for Theology?" *Criterion* 3 (1964): 10-21.

Mendelsohn, Everett. "Religious Foundamentalism and the Sciences." In *Fundamentalisms and Society*, ed. Martin E. Marty and R. Scott Appleby. Chicago: University of Chicago Press, 1993.

Messmer, Michael W. "Making Sense of/with Postmodernism." *Soundings* 69 (Fall 1985): 418-420.

Middleton, J. Richard, and Brian J. Walsh. *Truth Is Stranger Than It Used to Be: Biblical Faith in a Postmodern Age*. Downers Grove, IL: InterVarsity Press, 1995.

Midgley, Mary. *Evolution as a Religion*. New York: Methven, 1985.

Milbank, John. "Postmodern Critical Augustinianism: A Short Summa in Forty-Two Responses to Unasked Questions." *Modern Theology* 7, no. 3 (1991): 225-237.

_____. "The End of the Enlightenment: Post-Modern or Post-Secular?" In *The Debate on Modernity, Concilium* (December 1992), ed. Claude Geffré and Jean-Pierre Joshua, 39-48. London: SCM Press, 1992.

Miller, James B. "Beyond Dualism: Cosmological Issues for Christian Theology in a Post-Modern, Post-Critical Cultural Context." Ph.D. diss., Marquette University, 1986.

_____. "Considerations for a Discussion of Science and Religion." *Center for Theology and the Natural Sciences Bulletin* 10 (1990): 1-5.

_____. "The Emerging Postmodern World." In *Postmodern Theology: Christian Faith in a Pluralist World*, ed. Diogenes Allen et al., 1-19. New York: Harper and Row, 1989.

_____. "From Organism to Mechanism to History." In *The Church and Contempory Cosmology: Proceedings of a Consultation of the Presbyterian Church (U.S.A.)*, ed. James B. Miller and Kenneth E. McCall. Pittsburgh: Carnegie Mellon University Press, 1990.

Miller, Randolph Crump. *The Language Gap and God*. Philadelphia: Pilgrim Press, 1970.

Miller, Richard B. "The Reference of 'God': Causal Theory of Reference, Existence of God." *Faith and Philosophy* 3 (1986): 3-15.

Mitchell, Ralph G. *Einstein and Christ: A New Approach to the Defence of the Christian Religion*. Edinburgh: Scottish Academic, 1987 1986.

Mitros, Joseph F. "Norm of Faith in the Patristic Age." *Theological Studies* 29 (1968): 444-447.

Mohler, Richard Albert. "Evangelical Theology and Karl Barth: Representative Models of Response." Ph.D. diss., Southern Baptist Theological Seminary, 1989.

Molnar, Thomas. *God and the Knowledge of Reality*. New York: Basic Books, 1973.

Molnar, Paul D. "God's Self-communication in Christ: A Comparison of Thomas F. Torrance and Karl Rahner." *Scottish Journal of Theology* 50 (1997): 288-320.

Moltmann, Jurgen. "The Cosmic Community: A New Ecological Concept of Reality in Science and Religion." *Ching Feng* 29, no. 2-3 (1986): 93-105.

_____. "Reconciliation with Nature." *Word & World* 11 (1991): 117-123.

_____. *God in Creation*. San Fransisco: Harper and Row, 1985.

Montgomery, John Warwick. *Faith Founded on Fact*. New York: Thomas Nelson, 1978.

Moody, Dale. *The Word of Truth: A Summary of Christian Doctrine Based on Biblical Revelation*. Grand Rapids, MI: Eerdmans, 1981.

Mooney, Christopher F. "Theology and Science: A New Commitment to Dialogue." *Theological Studies* 52 (1991): 289-329.

_____. *Theology and Scientific Knowledge: Changing Models of God's Presence in the World*. Notre Dame: University of Notre Dame Press, 1996.

Moore, G. E. *Philosophical Studies.* New York: Harcourt Brace, 1922.

Moore, James R. *The "Post-Darwinian" Controversies: A Study of the Protestant Struggle to Come to Terms with Darwin in Great Britain and America, 1870-1900.* Cambridge: Cambridge University Press, 1979.

Moreland, J. P. *Christianity and the Nature of Science.* Grand Rapids, MI: Baker Book House, 1989.

_____. "Theistic Science and the Christian Scholar: A Response to Giberson." *Christian Scholars Review* 24, no. 4 (1995): 472-478.

Morris, Henry M. *The Troubled Water of Evolution.* San Deigo: Creation-Life Publishers, 1974.

_____. *A History of Modern Creationism.* San Deigo: Master Books, 1984.

Morris, Henry M., and Gary E. Parker. *What Is Creation Science*? San Diego, CA: Master Book Publishers, 1982.

Morrison, John Douglas. "The Self-Given Knowledge of God as He Is in the World: Thomas Forsyth Torrance's Christological-Trinitarian Assertation of Scientific Theological Realism." Ph.D. diss., University of Virginia, 1993.

_____. "Thomas Forsyth Torrance's Critique of Evangelical (Protestant) Orthodoxy." *Evangelical Quarterly* 67, no. 1 (1995): 53-69.

Morrison, David, and Clark R. Chapman. "The New Catastrophism." *Skeptical Inquirer* 14 (Winter 1990): 141-152.

Morrison, Roy Dennis. *Science, Theology, and the Transcendental Horizon: Einstein, Kant, and Tillich.* Atlanta, GA: Scholars Press, 1994.

Mott, Sir Nevill, ed. *Can Scientists Believe*? London: James, 1991.

Mueller, D. L. "Changing Conceptions of Christian Experience in Representative Contemporary Protestant Theologians." *Perspectives in Religious Studies* 1 (Fall 1974): 165-86.

Mueller, Gustav E. *Dialectic: A Way into and Within Philosophy.* New York: Bookman Associates, 1953.

Muller, Richard A. "Karl Barth and the Path of Theology into the Twentieth Century: Historical Observations." *Westminster Theological Journal* 51, no. 1 (Spring 1989): 25-50.

Murphy, Nancey C. *Anglo-American Postmodernity: Philosophical Perspectives on Science, Religion and Ethics.* Boulder, CO: Westview Press, 1997.

_____. *Reconciling Theology and Science: A Radical Reformation Perspective.* Kitchener, Ontario: Pandora Press, 1997.

_____. *Theology in the Age of Scientific Reasoning.* Ithaca, NY: Cornell University, 1990.

Murphy, Nancey, and James McClendon, Jr. "Distinguishing Modern and Postmodern Theologies." *Modern Theology* 5, no. 3 (1989): 199-212.

Murray-Rust, David M. *God in the Universe: A Twentieth-century Quaker Looks at Science and Theology.* London: Friends Home Service Committee for Woodbrooke College, 1973.

Musser, Donald W. "Sovereigns Past and Present: The Sciences and the Religious in the Theology of Langdon B. Gilkey." In *The Theology of Langdon B. Gilkey*, ed. Kyle Pasewark and Jef Pool. Macon, GA: Mercer University Press, 1999.

_____. "Theological Reasoning: A Tillichean Perspective." In *The Whirlwind in Culture,* ed. Donald Musser and Joseph Price. Bloomington, IN: Meyer Stone, 1988.

Musser, David W., and Joseph L. Price, eds. *The Whirlwind in Culture: Frontiers in Theology.* Bloomington, IN: Meyer Stone, 1988.

Nash, Ronald H. *The Word of God and the Mind of Man.* Grand Rapids, MI: Zondervan, 1982.

National Academy of Scientists. *On Being a Scientist.* Washington, DC: National Academy Press, 1995.

Nature, God and Humanity: Proceedings of the Third Seminar of the South African Science and Religion Forum (SASRF) of the Research Institute for Theology and Religion Held at Unisa on 1 & 2 June 1995. Pretoria: University of South Africa, 1996.

Nebelsick, Harold P. *Theology and Science in Mutual Modification.* New York: Oxford University Press, 1981.

_____. *Circles of God: Theology and Science from the Greeks to Copernicus.* Edinburgh: Scottish Academic Press, 1985.

Needleman, Jacob. *A Sense of the Cosmos: The Encounter of Modern Science and Ancient Truth.* New York: E. P. Dutton, 1965.

Neidhardt, W. Jim. "Key Themes in Thomas F. Torrance's Integration of Judeo-Christian Theology and Natural Science." In *The Christian Frame of Mind: Reason, Order, and Openness in Theology in Theology and Natural Science,* by Thomas Torrance, xi-xliv. Colorado Springs: Helmers and Howard, 1989.

Ness, Peter H. Van. "Introduction." In *Spirituality and the Secular Quest.* New York: Crossroad, 1996. Introduction.

Newell, Roger J. "Participatory Knowledge: Theology as Art and Science in C. S. Lewis and T. F. Torrance." Ph.D. thesis, University of Aberdeen, 1983.

Newman, J. *An Essay in Aid of a Grammar of Assent.* London: Burns, Oates, 1870.

Nicole, Roger. "The Biblical Concept of Truth." In *Scripture and Truth,* ed. D. A Carson and John D. Woodbridge, 287-298. Grand Rapids, MI: Zondervan, 1983.

Niditch, Susan. *Chaos to Cosmos: Studies in Biblical Patterns of Creation.* Chico, CA: Scholars Press, 1985.

Niebuhr, H. Richard. "Radical Faith and Western Science." In *Religion and the Natural Sciences: The Range of Engagement*, ed. James E. Huchingson, 47-56. Fort Worth: Harcourt Brace Jovanovich, 1993.

Noel, Daniel C. "God-Language Grounded." Review of *Naming the Whirlwind: The Renewal of God Language*, by Langdon Gilkey. *Anglican Theological Review* 53 (January 1971): 57-70.

Noll, Mark A. *Between Faith and Criticism*. San Francisco: Harper and Row, 1986.

_____, ed. *The Princeton Theology, 1812-1921: Scripture, Science, and Theological Method from Archibald Alexander to Benjamin Breckinridge Warfield*. Phillipsburg, NJ: Presbyterian and Reformed Pub. Co., 1983.

Norman, Bruce. "Presuppositions: The Key to the Formulation of Biblical Doctrine." *Journal of the Adventist Theological Society* 4, no. 1 (1993): 47-64.

Norris, Christopher. *The Truth about Postmodernism*. Oxford: Blackwell, 1993.

O'Brien, Pat F. A. "A Comparison of Natural Science and Orthodox Lutheran Theology with Respect to the Concept of Truth." B.D. thesis, Concordia Theological Seminary, 1970.

O'Connor, Robert C. "Science on Trial: Exploring the Rationality of Methodological Naturalism." *Perspectives on Science and Christian Faith* 49 (1997): 15-30.

Ockham, William. *Philosophical Writings*. Translated and edited by P. Boehner. Edinburgh: Nelson, 1957.

Oddie, William. *After the Deluge: Essays Towards the Desecularization of the Church*. London: SPCK, 1987.

Oden, Thomas C. *After Modernity . . . What? Agenda for Theology*. Grand Rapids, MI: Academie Books, 1990.

_____. *Two Worlds: Notes on the Death of Modernity in America and Russia*. Downers Grove, IL: InterVarsity Press, 1992.

Ogden, Schubert. *The Reality of God*. New York: Harper and Row, 1963.

Oken, Lorenz. *Elements of Physio-Philosophy* N.p., 1810.

Oliver, Harold H. "Complementarity of Theology and Cosmology." *Zygon* 13 (1978): 19-33.

O'Neil, John. *The Poverty of Postmodernism*. London: Routledge, 1994.

Osborne, Grant. "Christianity Challenges Postmodernism." *Evangelical Journal* 15, no. 1 (Spring 1997): 1-17.

_____. *The Hermeneutical Spiral: A Comprehensive Introduction to Biblical Interpretation*. Downers Grove, IL: InterVarsity Press, 1991.

Ostovich, Steven T. "History, Theology, and the Philosophy of Science." Ph.D. thesis, Marquette University, 1986.

_____. *Reason in History: Theology and Science as Community Activities*. Atlanta, GA: Scholars Press, 1990.

Otto, Helen Tzima. *Their Earthshaking News: When Science and Theology Speak the Same Urgent Language*. Houston, TX: Verenikia Press, 1995.

Otto, Rudolf. *The Idea of the Holy*. New York: Oxford University Press, 1950.

Owen, H. P. "The Scope of Natural Revelation in Rom 1 and Acts 17." *New Testament Studies* 5 (1958-1959): 133-143.

Packer, J. I. "Is Systematic Theology a Mirage? An Introductory Discussion." In *Doing Theology in Today's World*, ed. John D. Woodbridge and Thomas Edward McComiskey, 17-37. Grand Rapids, MI: Zondervan, 1991.

Padgett, Alan G. *God, Eternity and the Nature of Time*. London: Macmillan, 1992.

_____. "The Mutuality of Theology and Science: An Example from Time and Thermodynamics." *Christian Scholar's Review* 26, no. 1 (1996): 12-35.

Pagel, Heinz. *The Dreams of Reason*. New York: Bantam, 1989.

Pailin, David A. "Natural Theology." In *Companion Encyclopedia of Theology*, ed. Peter Byrne and Leslie Houlden, 388-98. New York: Routledge, 1995.

Paley, William. *Natural Theology*. Charlottesville, VA: Ibis Publishing, [1802].

_____. *The Works of William Paley*. London: Longman, 1838.

Pannenberg, Wolfhart. "The Crisis of the Scripture Principle in Protestant Theology." *Dialog* 2, no. 4 (Fall 1963): 307-313.

_____. *The Doctrine of Creation and Natural Science*. Wilmore, KY: Asbury Theological Seminary, 1994.

_____. "Providence, God and Eschatology." In *The Whirlwind in Culture*, ed. Donald Musser and Joseph Price. Bloomington, IN: Meyer Stone, 1988.

_____. *Theology and the Philosophy of Science*. Philadelphia: Westminster Press, 1976.

_____. *Toward a Theology of Nature: Essays on Science and Faith*. Louisville, KY: Westminster/John Knox Press, 1993.

Pasewark, Kyle A. "Power, Freedom and History: The Symbol of Divine Providence in Langdon Gilkey's Theology." In *The Theology of Langdon B. Gilkey: Systematic and Critical Studies*. Macon, GA: Mercer University Press, 1999.

Pasewark, Kyle A., and Jeff B. Pool, eds. *The Theology of Langdon B. Gilkey: Systematic and Critical Studies*. Macon, GA: Mercer University Press, 1999.

Patterson, Bob E., and Eric Rust, eds. *Science, Faith, and Revelation: An Approach to Christian Philosophy*. Nashville: Broadman Press, 1979.

Patterson, Sue. *Realist Christian Theology in a Postmodern Age*. Cambridge, UK: Cambridge University Press, 1999.

Paul, Iain. *Science and Theology in Einstein's Perspective*. Edinburgh: Scottish Academic Press, 1986.

Peacocke, Arthur. *Creation and the World of Science*. New York: Oxford University Press, 1979.

_____. "God and the Selfish Gene." In *Religion and the Natural Sciences: The Range of Engagement*, ed. James E. Huchingson, 329-336. Fort Worth: Harcourt Brace Jovanovich, 1993.

_____. *Intimations of Reality: Critical Realism in Science and Religion*. Notre Dame: University of Notre Dame Press, 1984.

_____. *Theology for a Scientific Age: Being and Becoming—Natural, Divine and Human*. London: SCM Press, 1993.

_____, ed. "Introduction." In *The Sciences and Theology in the Twentieth Century*. Notre Dame: University of Notre Dame Press, 1981.

Pearcey, Nancy R., and Charles B. Thaxton. *The Soul of Science: Christian Faith and Natural Philosophy*. Wheaton, IL: Crossway Books, 1994.

Pederson, Olaf. "Historical Interaction between Science and Religion." In *Science and Religion: One World—Changing Perspectives on Reality*, ed. Jan Fennema and Iain Paul, 139-160. Dordrecht: Kluwer Academic Publishers, 1990.

_____. *The Book of Nature*. Notre Dame: University of Notre Dame Press, 1992.

_____. *Physics, Philosophy and Theology: A Common Quest for Understanding*. Notre Dame: University of Notre Dame Press, 1988.

Pelikan, Jaroslav. *The Christian Tradition: A History of the Development of Doctrine*. 5 vols. Chicago: University of Chicago Press, 1989.

Penchansky, David. *The Politics of Biblical Theology: A Postmodern Reading*. Macon, GA: Mercer, 1995.

Percesepe, G. J. "The Unbearable Lightness of Being Post-modern." *Christian Scholar's Review* 20 (1990): 118-135.

Peters, Karl E. "The Concept of God and the Method of Science: An Exploration of the Possibility of Scientific Theology." Ph.D. diss., Columbia University, 1971.

_____. "Interrelating Nature, Humanity and the Work of God: Some Issues for Future Reflection." *Zygon* 27 (1992): 403-419.

_____. "Empirical Theology in the Light of Science." *Zygon* 27 (1992): 297-325.

Peters, Ted. *God--the World's Future: Systematic Theology for a Postmodern Era*. Minneapolis: Fortress Press, 1992.

_____. "Scientific Research and the Christian Faith." *Thought* 66, no. 260 (March 1991): 75-94.

_____. "Sola Scriptura and the Second Naivete." *Dialogue* 16 (Fall 1977): 268-280.

_____. "Theology and Science: Where Are We?" *Zygon* 31, no. 2 (June 1996): 323-343.

_____. *Ufos-God's Chariots? Flying Saucers in Politics, Science, and Religion*. Atlanta: John Knox Press, 1977.

_____. "Whirlwind as Yet Unnamed." *Journal of the American Academy of Religion* 42 (December 1974): 699-709.

_____, ed. *Cosmos as Creation: Theology and Science in Consonance*. Nashville: Abingdon Press, 1989.

Peukert, Helmut. *Science, Action, and Fundamental Theology: Toward a Theology of Communicative Action*. Cambridge, MA: MIT Press, 1984.

Phenix, Philip Henry. "Infinitude; a Study of Science, Theology, and the Scientific Spirit, with Special Reference to the 'New Physics'." Ph.D. thesis, Columbia University, 1950.

Phillips, Timothy R., and Dennis L. Okholm, eds. *Christian Apologetics in the Postmodern World.* Downer's Grove, IL: InterVarsity Press, 1995.

Placher, William C. *The Domestication of Transcendence: How Modern Thinking About God Went Wrong.* Louisville, KY: Westminster John Knox Press, 1996.

Plantinga, Alvin. *Does God Have a Nature?* Milwaukee: Marquette University Press, 1980.

_____. "Evolution, Neutrality, and Antecedent Probability: A Reply to Van Till and McMullin." *Christian Scholar's Review* 21, no. 1 (1991): 80-109.

_____. "When Faith and Reason Clash: Evolution and the Bible." *Christian Scholar's Review* 21, no. 1 (1991): 8-32.

Plato *Symposium.* New York: Liberal Arts Press, 1956.

Pohier, Jacques-Marie. "The Hermeneutic of Sin in the Light of Science, Technology and Ethics." In *Concilium, Moral Evil Under Challenge,* ed. Johannes B. Metz. New York: Herder and Herder, 1970.

Polanyi, Michael. "Faith and Reason." *Journal of Religion* 41 (1961): 237-247.

_____. *Personal Knowledge.* Chicago: University of Chicago Press, 1958.

_____. *Science, Faith and Society.* London: Oxford University Press, 1946.

Polkinghorne, John. "Creation and the Structure of the Physical World." *Theology Today* 44 (1987): 53-68.

_____. "Cross-traffic between Science and Theology." *Perspectives on Science and Christian Faith* 43 (1991): 144-151.

_____. "God's Action in the World." *Center for Theology and the Natural Sciences Bulletin* 10 (1990): 1-7.

_____. "The Nature of Physical Reality." *Zygon* 26 (1991): 221-236.

_____. *One World: The Interaction of Science and Theology.* Princeton: Princeton University Press, 1987.

_____. *Quarks, Chaos and Christianity.* London: Triangle, 1994.

_____. *Reason and Reality: The Relationship Between Science and Theology.* Philadelphia: Trinity Press International, 1991.

_____. "Reckonings in Science and Religion." *Anglican Theological Review* 74 (1992): 376-380.

_____. *Science and Creation.* London: SPCK, 1988.

_____. *Science and Christian Belief.* London: SPCK, 1986.

_____. *Science and Providence.* London: SPCK, 1989.

_____. "A Scientist's View of Religion." *Science and Christian Belief* 2 (1990): 83-94.

Pollack, Louis. *Fingerprints on the Universe: Searching for Belief and Meaning in Today's Turbulent World.* New York: Shaar Press, Mesorah Publications, 1994.

Pool, Jeff. "Beyond Postliberal Foundationalism: The Theological Method of Langdon B. Gilkey." In *The Theology of Langdon B. Gilkey: Systematic and Critical Studies,* ed. Kyle Pasewark and Jef Pool. Macon, GA: Mercer University Press, 1999.

Poole, M. *A Guide to Science and Belief.* Oxford: Lion, 1994.

Popper, Karl. *The Logic of Scientific Discovery.* New York: Harper and Row, 1959.

_____. *Objective Knowledge and Evolutionary Approach.* Oxford, England: Clarendon Press, 1979.

Poythress, Vern. *Science and Hermeneutics--Foundations of Contemporary Interpretation*. Grand Rapids, MI: Academie, 1988.

Preller, Victor. *Divine Science and the Science of God: A Reformulation of Thomas Aquinas*. Princeton: Princeton University Press, 1967.

Price, Derek. *Science since Babylon*. New Haven: Yale University Press, 1961.

Price, Joseph. "Cosmicization and Legitimization: Religious Dimensions of Aesthetic Worlds." In *The Whirlwind in Culture*, ed. Donald Musser and Joseph Price. Bloomington, IN: Meyer Stone, 1988.

Puddefoot, John C. "Faith's Third Age: Theology and Science in the Third Millennium." *Colloquium* 27, no. 2 (1995): 109-120.

Quine, W. V. O. "Two Dogmas of Empiricism." In *From a Logical Point of View*, 20-46. Cambridge: Harvard University Press, 1953.

Rabi, I. I. *Science: The Center of Culture*. New York: World Publishing, 1970.

Rae, Murray, Hilary D. Regan, and John Stenhouse, eds. *Science and Theology: Questions at the Interface*. Edinburgh, Scotland: T&T Clark, 1994.

Rahner, Karl. *Hominization: The Evolutionary Origin of Man as a Theological Problem*. New York: Herder and Herder, 1965.

_____. "Christology Within an Evolutionary View of the World." In *Theological Investigations*, vol. 5. Baltimore: Helicon Press, 1966.

_____. *Science and Christian Faith*. New York: Crossroad, 1988.

Ramm, Bernard. *The Pattern of Religious Authority*. Grand Rapids, MI: Eerdmans, 1959.

Ramsey, Ian. *Models and Mystery*. London: Oxford University Press, 1965.

Raschke, Carl. *Theological Thinking: An Inquiry*. Atlanta, GA: Scholars Press, 1988.

Rasmussen, Larry. "Ecocrisis and Theology's Quest." *Christianity and Crisis*, March 16, 1992, 83-87.

Ratzsch, Del. *Philosophy of Science: The Natural Sciences in Christian Perspective*. Downers Grove, IL: Inter Varsity Press, 1986.

Raymo, Chet. "God as Top Quark?" *Commonweal* 20, no. 5 (1994): 31-32.

Reed, John K. "A Biblical Christian Framework for Earth History Research, Part I—Critique of the Naturalist-Uniformitarian System." *Creation Science Quarterly* 33 (1996): 6-12.

Regan, Hilary, and Alan J. Torrance, eds. *Christ and Context: The Confrontation between Gospel and Culture*. Edinburgh: T & T Clark, 1993.

Reich, K. Helmut. "The Chalcedonian Definition: An Example of the Difficulties and the Usefulness of Thinking in Terms of Complementarity?" *Journal of Psychology and Theology* 18, no. 2 (1990): 148-159.

_____. "The Relation Between Science and Theology: The Case for Complementarity Revisited." *Zygon* 25, no. 4 (December 1990): 369-390.

Reichenbach, Hans. *The Rise of Scientific Philosophy*. Los Angeles: University of California Press, 1951.

Reid-Maroney, Nina Ruth. *Theology and Science in Philadelphia's Enlightenment, 1740-1800*. Ottawa: National Library of Canada, 1993.

Remelts, Glenn A. "Interaction of Science and Theology in the Christian Reformed Church, 1900-1930." M.A. thesis, Kansas State University, 1989.

Rice, Richard. *Reason and the Contours of Faith.* Riverside, CA: La Sierra University Press, 1991.

Richardson, Alan. *The Bible in the Age of Science.* Philadelphia: Westminster Press, 1961.

Richardson, Kurt Anders. "Trinitarian Reality: The Interrelation of Uncreated and Created Being in the Thought of Thomas Forsyth Torrance." Basel, Switzerland: University of Basel, 1993.

Ricoeur, Paul. *Hermeneutics and the Human Sciences.* Translated by John B. Thompson. Cambridge: Cambridge University Press, 1981.

_____. "The Model of the Text: Meaningful Action Considered as a Text." *Social Research* 38, no. 3 (1971): 538-555.

_____. "Toward a Hermeneutic of the Idea of Revelation." *Harvard Theological Review* 70 (1977): 1-37.

_____. "What Is a Text? Explanation and Interpretation." In *Mythic-Symbolic Language and Philosophical Anthropology,* ed. D. Rasmussen. The Hague: Martinus Nijhoff, 1971.

Rigby, Paul, Jojn van den Hengel, and Paul O'Grady. "The Nature of Doctrine and Scientific Progress." *Theological Studies* 52 (1991): 669-688.

Rike, Jennifer L. "From Liberalism to Postmodernism: The Role of Integrity in the Thought of Langdon Gilkey." In *The Theology of Langdon B. Gilkey: Systematic and Critical Studies,* ed. Kyle Pasewark and Jef Pool, 431-464. Macon, GA: Mercer University Press, 1999.

Ritschl, Albrecht. "Theology and Metaphysics: Towards a Reaproachment and Defense." In *Three Essays,* tran. Philip Hefner. Philadelphia: Fortress Press, 1972.

Robbins, J. Wesley. "Professor Gilkey and Alternative Methods of Theological Construction." *Journal of Religion* 52 (January 1972): 84-101.

Robinson, James M., ed. *The Beginnings of Dialectical Theology*. Translated by Keith R. Crim and Louis De Grazia. Richmond, VA: John Knox Press, 1962.

Rolston, Holmes, III. *Science and Religion: A Critical Survey*. Philadelphia: Temple University Press, 1987.

Rorty, Richard. *Objectivity, Relativism, and Truth: Philosophical Papers*. Cambridge: Cambridge University Press, 1991.

Ruben, David-Hillel. *Explaining Explanation*. London: Routledge, 1990.

Russell, Bertrand. *Religion and Science*. Oxford: Oxford University Press, 1972.

_____. *Why I Am Not a Christian and Other Essays*. London: Allen & Unwin, 1975.

Russell, Colin A. "The Conflict Metaphor and Its Social Origins." *Science and Christian Belief* 1 (1989): 3-26.

_____. *Cross-Currents: Interactions between Science and Faith*. Leicester: IVP, 1985.

_____. *The Music of Natural Theology*. New York: Open University Educational Enterprises, 1977.

Russell, Colin A., R. Hooykaas, and David C. Goodman. "The 'Conflict Thesis' and Cosmology." Block 1, Unit 1-3 of *Science and Belief: From Copernicus to Darwin*. London: Open University Press, 1974.

Russell, John Robert. "Cosmology and Theology." In *Religion and the Natural Sciences: The Range of Engagement*, ed. James E. Huchingson, 205-207. Fort Worth: Harcourt Brace Jovanovich, 1993.

_____. "Theological Lessons from Cosmology: Two Case Studies." *Cross Currents* (Fall 1991): 308-321.

Russell, Robert J., William R. Stoeger, and G. V. Coyne, eds. *Physics, Philosophy, and Theology: A Common Quest for Understanding*. Vatican City: Vatican Observatory, 1995.

Rust, Eric Charles. *Evolutionary Philosophies and Contemporary Theology*. Philadelphia: Westminster Press, 1969.

_____. *Nature—Garden or Desert? An Essay in Environmental Theology*. Waco, TX: Word Books, 1971.

_____. *Religion, Revelation & Reason*. Macon, GA: Mercer University Press, 1981.

_____. *Science, Faith and Revelation: An Approach to Christian Philosophy*. Macon, GA: Mercer University Press, 1979.

_____. *Science and Faith: Towards a Theological Understanding of Nature*. New York: Oxford University Press, 1967.

Sagan, Carl. "Does Truth Matter? Science, Pseudoscience, and Civilization." *Skeptical Inquirer* 20, no. 2 (March/April 1996): 28-33.

Samburski, Samuel. *The Physical World of the Early Greek Thinkers*. Oxford: Clarendon Press, 1948.

Sanders, James A. "Scripture as Canon for Post-Modern Times." *Biblical Theological Bulletin* 25 (1995): 56-63.

Saunders, Stephen Allen. "The Contribution of Phenomenology to Theology as Reflected in the Writings of Langdon Gilkey and Edward Farley." Th.D. diss., New Orleans Baptist Theological Seminary, 1987.

Scalise, Charles J. *Hermeneutics as Theological Prolegomena: A Canonical Approach*. Macon, GA: Mercer University Press, 1994.

_____. "'The Sensus Literalis' A Hermeneutical Key to Biblical Exegesis." *Scottish Journal of Theology* 42 (1989): 45-65.

Schadewald, Robert. "Scientific Creationism, Geocentricity and the Flat Earth." *The Skeptical Inquirer* (Winter 1981-2): 41-48.

Scharlemann, Robert P. Introduction to *Theology at the End of the Century: A Dialogue on the Postmodern*. Charlottesville, VA: The University Press of Virginia, 1990.

Schatzman, Evry. "A Threat to Science." *Skeptical Inquirer* 17 (Spring 1993): 302-305.

Schillebeeckx, Edward. *The Understanding of Faith: Interpretation and Criticism*. New York: Seabury Press, 1974.

Schilling, Harold K. "Making Connections: The Threefold and Circular Nature of Science and Religion." In *Religion and the Natural Sciences: The Range of Engagement*, ed. James E. Huchingson, 40-46. Fort Worth: Harcourt Brace Jovanovich, 1993.

Schindler, David L. "Theology and the Historical-Critical Claims of Modernity: On the Need for Metaphysics." *Comunio* 6 (1976): 73-94.

Schleiermacher, F. *On the Glaubenslehre: Two Letters to Dr. Lüke*. Translated by James O. Duke and Francis Fiorenza. Atlanta: Scholar's Press, 1981.

Schmitt, Francis O. "A Prescription for Generating a New Paradigm in the Context of Science and Theology." *Zygon* 27 (1992): 437-454.

Schneiders, Sandra M. "Does the Bible Have a Postmodern Message?" In *Postmodern Theology: Christian Faith in a Pluralist World*, ed. Frederic B. Burnham, 56-73. San Francisco: Harper and Row, 1989.

Schreurs, N. "Naar de basis van ons spreken over God: de weg van Langdon Gilkey." *Tijdschrift voor Theologie* 11, no. 3 (1971): 274-292.

Schwaller de Lubicz, R. A. *Symbol and the Symbolic: Egypt, Science and the Evolution of Consciousness*. Brookline, MA: Autumn Press, 1978.

Schwartz, Henry. *Method and Context as Problems for Contemporary Theology: Doing Theology in an Alien World*. Lewiston: Edwin Mellen Press, 1991.

Schweiker, William, and Per M. Anderson, eds. *Worldviews and Warrants: Plurality and Authority in Theology.* Lanham, MD: University Press of America, 1987.

"Science and Religion." *Seventh-day Adventist Encyclopedia.* Washington, DC: Review and Herald, 1976, 1302-5.

Science, History, and Theology: The Symposia Read at the Joint Session of the Aristotelian Society and the Mind Association at Bedford College, London, July 5th-8th, 1935. London: Harrison and Sons, 1935.

Scroggs, Robin. "The Bible as a Foundational Document." *Interpretation* 49, no. 1 (January 1995): 17-30.

Sell, Alan P. F. *Theology in Turmoil.* Grand Rapids, MI: Baker Book House, 1986.

Seventh-day Adventists Believe. Hagerstown, MD: Review and Herald, 1988.

Sharpe, Kevin J. "Relating Science and Theology with Complementarity: A Caution." *Zygon* 26, no. 2 (June 1991): 309-315.

Shea, John. "Religious Language in a Secular Culture: A Study in the Theology of Langdon Gilkey." Ph.D. diss., St. Mary of the Lake University, 1976.

Sheldrake, Rupert. *Natural Grace: Dialogues on Science & Spiritualiy.* London: Bloomsbury, 1996.

Sheppard, Gerald T. *The Future of the Bible: Beyond Liberalism and Literalism.* Toronto, Ontario: The United Church Publishing House, 1990.

_____. "How Do Neoorthodox and Post-neoorthodox Theologians Approach the "'Doing of Theology'" Today?" In *Doing Theology in Today's World,* ed. John D. Woodbridge and Thomas Edward McComiskey, 437-459. Grand Rapids, MI: Zondervan, 1991.

Sherrard, Philip. *Greek East and Latin West.* New York: Oxford University Press, 1959.

_____. *The Eclipse of Man and Nature: An Enquiry into the Origins and Consequences of Modern Science*. West Stockbridge, MA: Lindisfarne Press, 1987.

Shinn, Roger L. "The New Wave in Christian Thought." *Encounter* 28, no. 3 (Summer 1967): 219-255.

Shore, Steven N. "Scientific Creationism: The Social Agenda of a Pseudoscience." *Skeptical Inquirer* 17 (Fall 1992): 70-72.

Simmons, Stephen Arthur. "The Semantics of God and Nature in the Writings of Thomas F. Torrance." Ph.D. diss., The University of Chicago, 1995.

Sittler, Joseph. "Nature and Grace: Reflections on an Old Rubric." *Dialog* 3, no. 4 (Fall 1964): 252-256.

Smart, Ninan. "Truth, Criteria and Dialogue Between Religions." In *Religious Pluralism and Truth*, ed. Thomas Dean, 67-71. New York: State University of New York Press, 1995.

Smith, William Lloyd. "System Construction in Science, Theology and Philosophy: The Myths Men Live By." M.A. thesis, DePaul University, 1971.

Smith, Wolfgang. *Cosmos and Transcendence: Breaking Through the Barrier of Scientistic Belief*. Peru, IL: Sherwood Sugden and Co., 1984.

Snoke, David W. "Toward a Unified View of Science and Theology." *Perspectives on Science and Christian Faith* 43, no. 3 (September 1991): 166-162.

Snyder, Dale. *Theology and Scientific Accountability*. Sterling, KS: Sterling College, 1978.

Sölle, Dorothee. *Thinking About God: An Introduction to Theology*. Philadelphia: Trinity Press International, 1990.

Soskice, Janet. *Metaphor and Religious Language*. Oxford: Clarendon Press, 1985.

_____. "Knowledge and Experience in Science and Religion: Can We Be Realists." In *Physics, Philosophy and Theology: A Common Quest for Understanding*, ed. Robert Russell, William Stoeger and George Coyne, 173-184. Vatican City: Vatican Observatory, 1988.

Sperry, Roger W. "Paradigms of Belief, Theory and Metatheory." *Zygon* 27 (September): 245-257.

_____. "Search for Beliefs to Live by Consistent with Science." *Zygon* 26 (June): 237-58.

Spivey, Ted Ray. *The Renewed Quest: Essays in Literature, Science, and Theology*. Atlanta: Foote & Davies, 1969.

Spjuth, Roland. *Creation, Contingency and Divine Presence in the Theologies of Thomas F. Torrance and Eberhard Jüngel*. Lund, Sweden: Lund University Press, 1995.

Spradley, Joseph L. *Visions That Shaped the Universe: A History of Scientific Ideas about the Universe*. Dobuque, IA: Wm. C. Brown, 1955.

Spurway, Neil, ed. *Humanity, Environment, and God: Glasgow Centenary Gifford Lectures*. Cambridge, MA: Blackwell, 1993.

Staguhn, Gerhard. *God's Laughter: Man and His Cosmos*. New York: HarperCollins, 1992.

Stamps, Robert Julian. "The Sacrament of the Word Made Flesh: The Eucharistic Theology of Thomas F. Torrance." Ph.D. diss., St. John's College, University of Nottingham, 1986.

Stanesby, Derek. *Science, Reason and Religion*. New York: Routledge, 1988.

Stannard, Russell. *Grounds for Reasonable Belief*. Edited by Thomas Torrance. Edinburgh: Scottish Academic Press, 1989.

Steinmetz, David. "The Superiority of Precritical Exegesis." *Theology Today* 37 (1980): 27-38.

Stell, Stephen L. "Hermeneutics in Theology and the Theology of Hermeneutics: Beyond Lindbeck and Tracy." *Journal of the American Academy of Religion* 61:4 (1993): 678-703.

Stenger, Mary Ann. "Religious Pluralism and Cross-Cultural Criteria of Religious Truth." In *Religious Pluralism and Truth*, ed. Thomas Dean, 87-107. New York: State University of New York Press, 1995.

_____. "Paul Tillich's Theory of Theological Norms and the Problems of Relativism and Subjectivism." *Journal of Religion* 62 (1982): 359-375.

Stewart, John W. *Mediating the Center: Charles Hodge on American Science, Language, Literature, and Politics*. Princeton, NJ: Princeton Theological Seminary, 1995.

Stoeger, W. R. "Contemporary Cosmology and Its Implications for the Science-Religion Diologue." In *Physics, Philosophy and Theology: A Common Quest for Understanding*, ed. Robert Russell, William Stoeger, and George Coyne, 219-148. Vatican City: Vatican Observatory, 1988.

Stone, Jerome A. "The Viability of Religious Naturalism." *American Journal of Theology and Philosophy* 14, no. 1 (January 1993): 35-42.

Stout, Jeffrey. *The Flight from Authority: Religion, Morality, and the Quest for Autonomy*. Notre Dame: University of Notre Dame Press, 1981.

Streeter, Burnett Hillman. *Reality: A New Correlation of Science and Religion*. New York: Macmillan, 1926.

Studies in Science and Theology: Yearbook of the European Society for the Study of Science and Theology. Geneva: Labor et Fides, 1994.

Stuhlmacher, Peter. *How to Do Biblical Theology*. Allison Park, PA: Pickwick Publications, 1995.

Stratton, Beverly J. "Is Science Scientific? Affinities Between Theologians and Scientists as Interpreters in the Search for Truth." *Word and World* 13, no. 3 (Summer 1993): 269-276.

Suh, Chul Won. *The Creation Mediatorship of Jesus Christ*. Amsterdam: Rodopi, 1982.

Swidler, Leonard. *After the Absolute: The Diological Future of Religious Reflection*. Minneapolis: Fortress Press, 1990.

Swift, Thomas Madison, IV. "Thomas Kuhn's Philosophy of Science and Its Influence on Theology." M.Div. thesis, Emmanuel School of Religion, 1985.

Taylor, Mark C. *Erring: A Postmodern A/theology*. Chicago: University of Chicago Press, 1984.

Taylor, Michael Allyn. "Human Generation in the Thought of Thomas Aquinas: A Case Study on the Role of Biological Fact in Theological Science." S.T.D. thesis, Catholic University of America, 1982.

Terreros, Marco T. "Death Before the Sin of Adam: A Fundamental Concept in Theistic Evolution and Its Implications for Evangelical Theology." Ph.D. diss., Andrews University, 1994.

Theissen, Gerd. *Biblical Faith: An Evolutionary Approach*. Philadelphia: Fortress Press, 1985.

Thiemann, Ronald. *Revelation and Theology: The Gospel as Narrated Promise*. Notre Dame, IN: University of Notre Dame Press, 1985.

Thiselton, Anthony C. *Interpreting God and the Postmodern Self: On Meaning, Manipulation and Promise*. Grand Rapids, MI: Eerdmans, 1995.

_____. *The Two Horizons: New Testament Hermeneutics and Philosophical Description with Special Reference to Heidegger, Bultmann, Gadamer and Wittgenstein*. Exter: Paternoster Press, 1980.

Thomas, Owen C. "The Challenge of Postmodernism." *Anglican Theological Review* 72, no. 2 (1992): 209-219.

Thompson, Alexander. *Tradition and Authority in Science and Theology With Reference to the Thought of Michael Polanyi*. Edinburgh: Scottish Academic Press, 1987.

Thompson, Alden. *Inspiration*. Hagerstown, MD: Review and Herald, 1991.

Thompson, Ian J. "The Consistency of Physical Law with Divine Immanence." *Science and Christian Belief* 5, no. 1 (1993): 19-36.

Thompson, J. B., ed. *Hermeneutics and the Human Sciences*. Cambridge: Cambridge University Press, 1981.

Thornton, L. S. *Revelation and the Modern World: The Form of a Servant*. London: Dacre Press, 1950.

Thorsen, Donald. *The Wesleyan Quadrilateral: Scripture, Tradition, Reason and Experience as a Model of Evangelical Theology*. Grand Rapids, MI: Zondervan, 1990.

Teilhard de Chardin, Pierre. *Christianity and Evolution*. New York, Harcourt Brace Jovanovich, 1969.

_____. "Some Reflections on Progress." In *Religion and the Natural Sciences: The Range of Engagement*, ed. James E. Huchingson, 285-297. Fort Worth: Harcourt Brace Jovanovich, 1993.

Temple, William. *Nature, Man and God*. New York: St. Martin's Press, 1956.

Thompson, William. "Theology's Method and Linguistic Analysis in the Thought of Langdon Gilkey." *The Thomist* 36 (July 1972): 363-94.

Tilley, Terrence W., et al. *Postmodern Theologies: The Challenge of Religious Diversity*. Maryknoll, NY: Orbis Books, 1996.

Tillich, Paul. "Answer to Barth." In *The Beginnings of Dialectical Theology*, ed. James M. Robinsion, 155-158. Richmond, VA: John Knox Press, 1962.

_____. *Biblical Religion and the Search for Ulitmate Reality*. Chicago: University of Chicago Press, 1955.

_____. "Critical and Positive Paradox: A Discussion with Karl Barth and Friedrich Gogarten." In *The Beginnings of Dialectical Theology*, ed. James M. Robinson, 133-141. Richmond, VA: John Knox Press, 1962.

_____. *Systematic Theology*. 3 vols. Chicago: University of Chicago Press, 1963.

_____. *The System of the Sciences*. East Brunswick, NJ: Associated University Press, 1981.

_____. *Visionary Science*. Detroit: Wayne State University Press, 1987.

Tinker, Melvin. Review of Science and Hermeneutics. *Science and Christian Belief* 2, no. 1 (April 1990): 77-78.

Torrance, Ian R. "A Bibliography of the Writings of T. F. Torrance 1941-1989." *Scottish Journal of Theology* 43, no. 2 (1990): 225-262.

Toulmin, Stephen. Foreword to *Rethinking Knowledge: Reflections Across the Disciplines*. Edited by Robert Goodman and Walter Fisher. New York: State University of New York Press, 1995.

_____. "The Historicization of Natural Science: Its Implications for Theology." In *Paradigm Change in Theology: A Symposium for the Future*, ed. Hans Küng and David Tracy, tran. Margaret Köhl, 233-241. New York: Crossroad, 1991.

_____. "The New Philosophy of Science and the 'Paranormal'" *Skeptical Inquirer* 9 (Fall 1984): 48-55.

_____. *The Return to Cosmology: Postmodern Science and the Theology of Nature*. Berkeley: University of California Press, 1982.

Toumey, Christopher P. *God's Own Scientists: Creationists in a Secular World*. New Brunswick, NJ: Rutgers University Press, 1994.

Trachtenberg, Stanley. *Critical Essays on American Postmodernism*. New York: Macmillan, 1995.

Tracy, David. *Blessed Rage for Order: The New Pluralism in Theology*. San Francisco: Harper and Row, 1988.

_____. "Theology and the Many Faces of Postmodernity." *Theology Today* 51, no. 1 (1994): 104-114.

_____. "The Question of Criteria for Inter-Religious Dialogue: A Tribute to Langdon Gilkey." In *The Whirlwind in Culture*, ed. Donald Musser and Joseph Price. Bloomington, IN: Meyer Stone, 1988.

Tracy, David, and Nicholas Lash, eds. *Cosmology and Theology*. New York: Seabury Press, 1983.

Tracy, George E. "Limit Language: A Deeper Heritage." *Worship* 50 (1976): 206-213.

Trembath, Kern Robert. *Evangelical Theories of Biblical Inspiration: A Review and Proposal*. New York: Oxford University Press, 1987.

Triplett, Timm. "Recent Work on Foundationalism." *American Philosophical Quarterly* 27, no. 2 (April 1990): 93-115.

Trook, Douglas Alan. "The Unified Christocentric Field: Toward a Time-Eternity Relativity Model for Theological Hermeneutics in the Onto-Relational Theology of Thomas F. Torrance." Ph.D. diss., Drew University, 1986.

Troyer, James L. *The Scientific Method and Theology*. Elkhart, IN: J. L. Troyer, 1968.

Trusted, Jennifer. *Physics and Metaphysics: Theories of Space and Time*. London: Routledge, 1991.

Turner, William B. *Theology--the Quintessence of Science*. New York: Philosophical Library, 1981.

Tertulian. *Perscription Against Heretics: Sources of the Western Tradition*. Edited by Marvin Perry. Boston, MA: Houghton Mifflin, 1995.

Van Bemmelen, Peter M. "Issues in Biblical Inspiration: Sanday and Warfield." Th.D. diss., Andrews University, 1987.

Van den Beukel, A. *God and the Scientists*. London: SCM, 1990.

Van Huyssteen, Wentzel. "Should We Be Trying So Hard to Be Postmodern?" *Zygon* 32 (December 1997): 567-584.

_____. *Theology and the Justification of Faith: Constructing Theories in Systematic Theology*. Grand Rapids, MI: Eerdmans, 1989.

Van Israel, Bastian. "Is Scripture Becoming Less Important?" In *Scripture: The Presence of God,* ed. Pierre Benoit, Roland Murphy, and Bastian Van Israel, 157-175. New York: Paulist Press, 1969.

Van Ness, Peter H. *Spirituality and the Secular Quest*. New York: Crossroad, 1996.

Van Til, Cornelius. *Christianity and Barthianism*. Grand Rapids, MI: Baker, 1962.

_____. *The New Modernism*. London: James Clarke, 1946.

Van Till, Howard J. "Is Special Creationism a Heresy?" *Christian Scholar's Review* 22 (June 1993): 380-395.

Van Till, Howard J., and Phillip E. Johnson. "God and Evolution: An Exchange." *First Things* 34 (June/July 1993): 32-41.

Veith, Gene Edward. *Postmodern Times: A Christian Guide to Contemporary Thought and Culture*. Wheaton, IL: Crossway, 1994.

Via, Dan O. "New Testament Theology: Historical Event, Literary Text, and the Locus of Revelation." *Perspectives in Religious Studies* 19, no. 4 (Winter 1992): 369-388.

Virkler, Henry A. *Hermeneutics: Principles and Processes of Biblical Interpretation*. Grand Rapids, MI: Baker, 1981.

Wainwright, William J. "Doctrinal Schemes, Metaphysics and Propositional Truth." In *Religious Pluralism and Truth*, ed. Thomas Dean, 73-85. New York: State University of New York Press, 1995.

Wald, George. "Life and Mind in the Universe." In *Religion and the Natural Sciences: The Range of Engagement*, ed. James E. Huchingson, 214-219. Fort Worth: Harcourt Brace Jovanovich, 1993.

Walsh, Brian. *Langdon Gilkey: Theologian for a Culture in Decline*. Lanham, MD: University Press of America, 1991.

Ware, James. *Not With Words of Wisdom: Performative Language and Liturgy*. Washington, DC: University Press of America, 1981.

Ware, Robert. "The Use of Scripture in Current Theology." In *Theology, Exegesis and Proclamation*, ed. Roland Murphy, 115-128. New York: Herder and Herder, 1971.

Warfield, B. B. "The Idea of Systematic Theology." In *The Necessity of Systematic Theology*, ed. John Jefferson Davis, 127-167. Grand Rapids, MI: Baker Book House, 1980.

_____. *Studies in Theology*. Grand Rapids: Baker Book House, 1981.

Wassermann, Christoph, Richard Kirby, and Bernard Rordorf. *The Science and Theology of Information: Proceedings of the Third European Conference on Science and Theology, Geneva, March 29 to April 1, 1990*. Geneva: Labor et Fides, 1992.

Waugh, Patricia. *Postmodernism: A Reader*. London: Edward Arnold, 1992.

Weightman, Colin. *Theology in a Polanyian Universe: The Theology of Thomas Torrance*. New York: Peter Lang, 1994.

Wells, David. F. *No Place for Truth: Whatever Happened to Evangelical Theology*? Grand Rapids, MI: Eerdmans, 1993.

_____. "The Theologian's Craft." In *Doing Theology in Today's World*, ed. John D. Woodbridge and Thomas Edward McComiskey, 171-194. Grand Rapids, MI: Zondervan, 1991.

Westaway, Frederic William. *Science and Theology Some Common Aims and Methods*. London: Blackie, 1932.

Whitcomb, John C. *Genesis and Science*. Arlington, IL: International Ministries to Israel, 1988.

_____. *The Origin of the Solar System: Biblical Inerrancy and the Double-revelation Theory*. Philadelphia, PA: Presbyterian and Reformed Pub. Co., 1964.

White, Andrew Dickson. *A History of the Warfare of Science and Theology in Christendom*. New York: Appleton, 1896.

White, Ellen G. "Ellen White's Statements Relating to Geology and Earth Sciences." Washington, DC: Ellen G. White Estate, 1982.

White, Edward. *Science and Religion in American Thought: The Impact of Naturalism*. Stanford: Stanford University Press, 1950.

Whitehead, A. N. *Science and the Modern World*. New York: A Mentor Book, 1948.

Who's Who in Theology and Science: An International Biographical and Bibliographical Guide to Individuals and Organizations Interested in the Interaction of Theology and Science. Framingham, MA: Winthrop Publishing, 1992.

Wicken, Jeffrey S. "Theology and Science in an Evolving Cosmos: A Need for Dialogue." *Zygon* 23 (1988): 45-55.

Wilcox, David. "Covenantal Science: Impossible or Required?" *Christian Scholar's Review* 23, no. 2 (1993): 367-379.

Wild, Robert A. "Creation in the Teaching of Paul." *The Bible Today* 26 (1988): 146-155.

Wildiers, Max. *The Theologian and His Universe*. New York: Seabury Press, 1982.

Wiles, Maurice. *What Is Theology?* New York: Oxford University Press, 1976.

Wilkenson, David. *God, the Big Bang and Stephen Hawking*. Tunbridge Wells: Monarch, 1993.

Wilkenson, David, and Rob Frost. *Thinking Clearly about God and Science*. Crowborough: Monarch, 1996.

Williams, R. Nantlais. *Faith, Facts, History, Science and How They Fit Together*. Wheaton, IL: Tyndale, 1974.

Williamson, Clarke. "The Divine Obituary Was Premature." *Encounter* 31 (Autumn 1970): 396-99.

Willingale, Alan. "Review of *Theological Science*." *Evangelical Quarterly* 42 (1970): 187-190.

Wilson, David B. "On the Importance of Eliminating *Science* and *Religion* from the History of Science and Religion." In *Facets of Faith and Science*, ed. Jiste M. van der Meer, 27-48. Lanham, MD: University Press of America, 1996.

Wilson, Edward O. *On Human Nature*. Cambridge: Harvard University Press, 1978.

Winquist, Charles E. "Theology, Symbolism and Language in the Thought of Langdon Gilkey." In *The Theology of Langdon B. Gilkey: Systematic and Critical Studies*, 259-276. Macon GA: Mercer University Press, 1999.

Wittgenstein, L. *Philosophical Investigations*. New York: Macmillan, 1953.

Woodbridge, John D. "A Neoorthodox Historiography Under Siege." Part 1 of "Recent Interpretations of Biblical Authority." *Bibliotheca Sacra* 142, no. 565 (January-March 1985): 3-15.

_____. "The Rogers and McKim Proposal in the Balance." Part 2 of "Recent Interpretations of Biblical Authority." *Bibliotheca Sacra* 142:566 (April-June 1985): 99-113.

_____. "Does the Bible Teach Science?" Part 3 of "Recent Interpretations of Biblical Authority." *Bibliotheca Sacra* 142, no. 567 (July-September 1985): 195-208.

_____. "Is Biblical Inerrancy a Fundamentalist Doctrine?" Part 4 of "Recent Interpretations of Biblical Authority." *Bibliotheca Sacra* 142, no. 568 (October-December 1985): 292-305.

Woodfin, Yandall. *With All Your Mind: A Christian Philosophy.* Nashville, TN: Abingdon, 1980.

Woodsmall, Wyatt Lee. "An Analysis of the Use of Models in Science and Religion: A Clarification of the Notion of 'Theological Model' in Response to Some Misunderstandings of This Notion on the Part of Two Writers in the Philosophy of Religion." Ph.D. diss., Columbia University, 1976.

Worthing, Mark William. *Foundations and Functions of Theology as a Universal Science: Theological Method and Apologetic Praxis in Wolfhart Pannenberg and Karl Rahner.* Frankfurt am Main: P. Lang, 1996.

Wright, John H. "Theology, Philosophy, and the Natural Sciences." *Theological Studies* 52 (1991): 651-668.

Wyatt, Lee, and W. Jim Neidhardt. "Judeo-Christian Theology and Natural Science: Analogies--An Agenda for Future Research." *Perspectives on Science and Christian Faith* 43, no. 1 (March 1991): 14-28.

Wyschogrod, Edith. "On Deconstructing Theology: A Symposium on *Erring: A Postmodern A/theology.*" *Journal of the Amedican Academy of Religion* 54, no. 3 (1986): 523-557.

_____. *Saints and Postmodernism: Revisioning Moral Philosophy.* Chicago: University of Chicago Press, 1990.

Yanase, Michael Mutsuo. *Meeting God Through Science: Hidden Realism.* Translated by William Johnston. Tokyo: S.J. House, 1991.

Yerkes, James O. "'A Sharp Turn': Christology in a Time of Troubles." In *The Theology of Langdon B. Gilkey,* 363-400. Macon, GA: Mercer University Press, 1999.

Young, Davis A. "Scripture in the Hands of Geologists, Parts One and Two." *Westminster Theological Journal* 49 (1987): 1-34, 257-304.

Zuill, Henry. "When Science and Religion Meet, How Do We Keep Faith?" *Adventist Education* (February/March 1995): 14-19.

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The Cosmic Christ of Scripture: How to Read God's Three Books. Northern Caribbean University Press, to be published in 2004).

"The Good News about Gospel of God: 21st Ministry and the Sanctuary." *Issues in Theology and Spiritual Leadership* 4, no. 1 (2002): 45-74.

"The Harmonious Development of Faith and Learning at Northern Caribbean University." *Issues in Theology and Spiritual Leadership* 3, no. 1 (2001): 67-103.

"The Divine-Human Christ: Unveiling Divinity in Humanity." *Issues in Theology and Spiritual Leadership* 2, no. 1 (2000): 19-40.

"Science and Theology." Concluding chapter in *Creation, Catastrophe, and Calvary: Why a Global Flood Is Vital to the Atonement*, ed. John Templeton Baldwin, 172-208. Hagerstown, MD: Review and Herald, 2000.

"The Pre-Advent Explosion of Knowledge: Scripture Authority and Plural Revelations." *Issues in Theology and Spiritual Leadership* 1, no. 1 (1999): 11-35.

"Review of *Christian Apologetics in a Postmodern World*, by Timothy R. Phillips." *Andrews University Seminary Studies* 37 (Spring 1999): 140-142.

"Review of *Reported Miracles: A Critique of Hume*, by Joseph Houston." *Andrews University Seminary Studies* 36 (Autumn 1998): 293-294.

"Review of *The Creation-Evolution Debates*, by Ronald L. Numbers." *Andrews University Seminary Studies* 36 (Autumn 1998): 301-303.

"The Servant-Master Roles of the Laws of Jesus, Scripture and Nature." *Journal of the Adventist Theological Society* 9 (Spring-Autumn 1998): 278-309.

"Science and Theology: Focusing the Complementary Lights of Jesus, Scripture and Nature." *Journal of the Adventist Theological Society* 6 (1995): 6-51.

Seventh-day Adventist Theological Bibliography (1851-1994). Seventh-day Adventist Theological Seminary, Andrews University, Berrien Springs, MI, 1995.

"Review of *Nature, Reality and the Sacred: The Nexus of Science and Religion*, by Langdon Gilkey." *Andrews University Seminary Studies* 33 (Autumn 1995): 300-302.

"Review of *Christ before the Manger: The Life and Times of the Preincarnate Christ*, by Ron Rhodes." *Andrews University Seminary Studies* 33 (Autumn 1995): 318-319.

"Review of *The Myth of Religious Neutrality: An Essay on the Hidden Role of Religious Beliefs in Theories*, by Roy A. Clouser." *Andrews University Seminary Studies* 32 (Spring-Summer 1992): 121-123.