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DIFFERENCE WITHIN THEOLOGY OF NATURE: THE STRATEGIES OF INTELLIGIBILITY AND CREDIBILITY

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This author examines and augments a particular aspect of Ian Barbour's well-known four-fold typology for relating religion and science (conflict, independence, dialogue, and integration) in order to clarify two options available for theology as it develops a robust view of creation in conversation with modern science. Within integration, Barbour identifies several subtypes, including "theology of nature." The Gifford Lectures of Arthur Peacocke and John Polkinghorne provide important examples of theology of nature, yet differences between their approaches remain unexplained within Barbour's typology. An explanation is offered here, showing that Peacocke and Polkinghorne employ two distinct strategies to construct a theology of nature: the strategy of intelligibility and the strategy of credibility. After characterizing these strategies, the author suggests that at present the relationship between them takes the form of a dilemma.

Theology has to do, not with natural objects, but with states and movements of man's spiritual life.

—Albrecht Ritschl, 1888¹

The turbulent history of the relation of science and theology bears witness to the impossibility of theology seeking a peaceful haven, protected from the science of its times...

—Arthur Peacocke, 1993²

What I want to know is whether the strange and exciting claims of orthodox Christianity are tenable in a scientific age.

—John Polkinghorne, 1996³

Introduction

As part of the theological legacy of Isaac Newton and Immanuel Kant, the question of whether scientific knowledge of the physical world should inform theological reflection has received a great deal of attention by Protestant theologians in the last two centuries.⁴ During the nineteenth century, a dominant approach, especially among liberal Protestants such as Ritschl, sought to retain the integrity of human experience over and against a mechanistic world by distinguishing between

the realm of nature and the realm of spirit, the latter of which was taken as humanity's true context.⁵ The human person was elevated above the realm of natural law and thus freed from the confines of physical processes. Persons were not to be thought of as objects belonging to the world of nature but rather, to put it in Ritschlian terms, as citizens of the Kingdom of God.

By ignoring the rootedness of human life in the physical matrix of the world, theological accounts of humanity such as Ritschl's unfortunately, if understandably, provided an incomplete, fractured view of creation.⁶ The legacy of this kind of view remains today in the widespread neglect of strategies for establishing connections between theological claims and related claims from other disciplines, especially the sciences. Theology has tended to react to science's mechanistic view of the world by creating a world of its own, a theological safe haven for reflection and retreat.⁷ However, the cost of this isolationist strategy has not gone unnoticed.

In recent decades, a growing number of theologians have seen the need to engage contemporary science in new ways rather than

uncritically perpetuate reactions to an outdated, mechanistic understanding of the world. In response to the story told by twentieth-century science of the openness, novelty, and creativity inherent in the physical world, and of the intricate links between the natural world and human life, theologians are returning to such biblical themes as the unity of the person and the significance of all creation within God's purposes.⁸ There is a growing sense that the question for theology is not *whether* it ought to engage the sciences, but *how* it should do so.

Among those who have led the call for a reassessment of theological doctrine in light of contemporary scientific knowledge are scientist-turned-theologians Arthur Peacocke and John Polkinghorne. Most notably in their Gifford Lectures, *Theology for a Scientific Age* and *Faith of a Physicist*, respectively, these two authors have embraced the task of recasting theology in light of scientific knowledge; and both have done so without either wantonly abandoning traditional theological claims or unduly submitting to the bare philosophical materialism erroneously trumpeted by some present-day apologists as the logical entailment of modern science. As masters of their respective scientific fields, biochemistry and physics, Peacocke and Polkinghorne have helped numerous theologians and pastors come to a more integrated and nuanced view of the physical world through their scientifically informed theological writings.

While each of these authors acknowledges a certain affinity between his work and natural theology's traditional attempt to prove the existence of God through reason and experience, their theological interests lie not in using science to prove God but rather in integrating a wide range of theological and scientific claims.⁹ In taking on this broader task, Polkinghorne and Peacocke have each adopted particular strategies for establishing connections between theology and science. This paper identifies the distinctiveness of their strategies as well as the implications of these strategies for the theology-and-science dialogue.

A good place to begin talking about different strategies to relate theology and science is Ian Barbour's well-known four-fold typology, which he developed in his influential work *Religion in an Age of Science*. Here he presents a careful and detailed overview of four approaches to relating theology and science—conflict, independence, dialogue, and integration.¹⁰ With regard to integration, the view I adopt and develop here, Barbour identifies several approaches or sub-views, one of which he calls "theology of nature." (See figure 1 at the end of this section for the various sub-views Barbour identifies within each of his four main views.) In this paper, I propose to add a further layer to Barbour's typology by arguing for the thesis that although Peacocke and Polkinghorne each work within the integration view to develop a "theology of nature" in their Gifford Lectures, they do so by employing two distinct strategies: the strategy of *intelligibility* (Peacocke) and the strategy of *credibility* (Polkinghorne).¹¹ Thus, although I find the term "theology of nature" an apt characterization of the common approach found in Peacocke and Polkinghorne, this paper focuses on several important differences between their approaches—over issues such as the Virgin Birth and the Empty Tomb—differences which Barbour's typology, helpful though it is, cannot explain.¹² As a means of differentiating within the term "theology of nature," the categories *intelligibility* and *credibility* clarify some of the challenges and options for theology as it seeks to take account of contemporary scientific knowledge.¹³

I begin the argument by presenting the merits of "theology of nature" in light of Barbour's identification and comparison of this and two other approaches to integration: theology of nature, natural theology, and systematic synthesis. In the second section, I establish that Peacocke and Polkinghorne both intend to develop a theology of nature in line with Barbour's use of the term. In the third and central section I present the strategies of intelligibility and credibility as characterizations of Peacocke and Polkinghorne's ap-

proaches. Here I argue that although both strategies are loyal to theology of nature's general concerns, each nonetheless advances a distinct mode of reasoning. In the fourth section I offer a preliminary assessment of the relationship between these two strategies. Given the virtues and risks associated with each strategy, I characterize the relationship

In the first approach, "natural theology," science comes to theology's aid by describing the intricacies of natural processes such as the development and structure of the cosmos given by the Big Bang cosmological scenario. Here the focus rests primarily on establishing evidence for God's existence. Darwin's theory of biological evolution dealt a serious blow to natural theology in the nineteenth century by

arguing that design in nature, which had previously been taken as straightforward evidence of God's handiwork in the world, was instead the result of undirected natural processes merely masquerading as design—the so-called "apparent" design of nature. Since Darwin, natural theologians have largely abandoned arguments from structural complex-

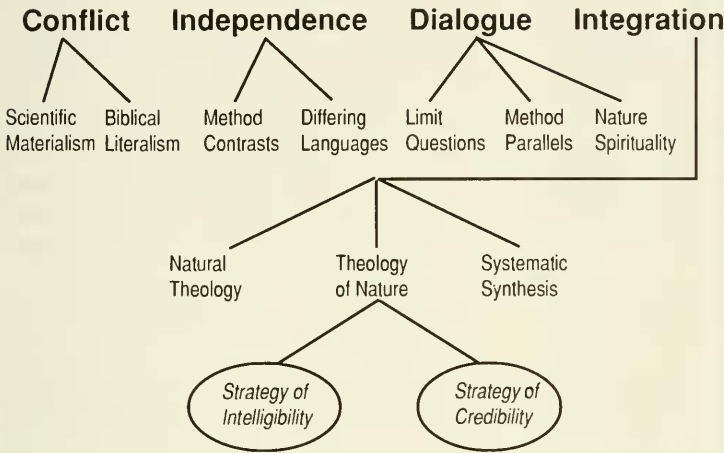


Figure 1. Barbour's typology for relating science and religion with subcategories. The strategies developed in this essay, *intelligibility* and *credibility*, function as subcategories within "theology of nature."

between them as an unresolved dilemma for theology of nature.

I. Integration with integrity

What does it mean to integrate theological and scientific claims, and what are the different possibilities for achieving integration? In his typology, Barbour identifies integration with the aim of developing direct relationships between theological doctrines and particular scientific theories.¹⁴ Integration seeks to benefit from insights gained through "dialogue," the third of Barbour's options which focuses on common interests (e.g., the well-being of nature) and methods (e.g., the central role of inter-subjectivity in securing knowledge). However, integration goes beyond dialogue in pursuit of systematic links between theology and science. Barbour identifies three approaches to integration.

ity and have turned instead to the striking properties of various forms of matter and their associated scientific laws, such as the importance of the proton/neutron mass difference for the development of biological life, which theologians suggest point to the existence of a designing mind behind the order of the universe (the so-called fine-tuning of the universe).¹⁵ Whether by appeal to design or fine-tuning, Barbour rightly judges that natural theology is of limited value to the theological enterprise because it leaves a host of important theological considerations untouched: the human experience of reorientation and transcendence, the movement from brokenness to healing, and the sense of new relationship with God and the world.¹⁶ By considering only those aspects of reality strictly describable within the limited scope of scientific investigation, natural theology's narrow consideration of the issue

of God's existence makes for a poor introduction to the more complex aspects of reality such as religious experience and historical revelation.

Another possibility Barbour identifies for theology as it turns an ear toward science is "systematic synthesis." As the term suggests, this approach integrates scientific and theological ideas into a more inclusive metaphysical system. The approach of systematic synthesis relies on a particular metaphysics (Barbour prefers process philosophy) to provide a common set of general categories for integrating theology and science into a more coherent vision of reality. One danger inherent in this approach mentioned by Barbour is the distortion that can result from mapping the variety and complexity of human experience onto an overly neat intellectual system.¹⁷ In such cases, for example, the horror of human suffering often tends to be trivialized through the very act of explanation and categorization. Equally serious, theology risks being made into an example of a more general philosophical position. Whereas natural theology begins with science as it struggles to move from God's existence to God's characteristics and purposes, systematic synthesis starts with theology but risks giving philosophy the last word. Both approaches jeopardize the integrity of theology by making theology less than an equal participant in the conversation with science and the quest for understanding.

Barbour uses the term "theology of nature" to designate the approach that strives to preserve theology's disciplinary integrity while attaining genuine interaction with science. He defines theology of nature as "critical reflection, within a tradition based on historical revelation and religious experience, in which theological beliefs concerning nature are reformulated in the light of contemporary science."¹⁸ The only dissatisfaction I have with Barbour's definition stems from his restricting the range of relevant theological beliefs to those "concerning nature" alone. Barbour's *Religion and Science* puts forward a significantly more ambitious agenda than simply a revised doctrine of the natural world (and rightly so, given the interconnected character of theological

thought), which leads me to propose the following modification to Barbour's definition: theology of nature is critical reflection, within a tradition based on historical revelation and religious experience, in which the *entire scope of theology* is up for consideration and reformulation in light of contemporary science. This broadened definition of theology of nature, which I assume below, goes beyond a reconsideration of the place of "nature" in theology to include more general issues regarding the task of theology in light of scientific knowledge. Taken in this revised and expanded form, theology of nature becomes a legitimate and appropriate alternative to natural theology and systematic synthesis.¹⁹ Moreover, theology of nature brings into the discourse of theology the epistemological consideration of theology's relation to other disciplines and modes of knowledge, a topic which has often been ignored or viewed as preliminary to the theological task.

Theology of nature, unlike natural theology, brings a "full wealth of conviction" to the conversation with science, even as it is amenable to being reshaped through a critical engagement with what science has to say about the world.²⁰ Theology of nature also need not be unappreciative of the clarity that comes with clear philosophical concepts, but it resists being subsumed into a more general philosophical system—it begins not with general categories, but with the particulars of Christian revelation and experience. From this starting point, theology of nature moves outward to engage claims from other disciplines (as well as other religions) about the world. As an approach to integration, theology of nature thus occupies a mediating position between the more scientifically driven approach of natural theology and the more philosophically oriented approach of systematic synthesis. This approach is, thus, well suited to the task of engaging science while maintaining the integrity of theological claims. Having put forward this understanding, I turn now to Peacocke's and Polkinghorne's Gifford Lectures and argue that both merit the designation, "theology of nature."

II. Two theologians, one approach

Theology of nature, as Barbour has developed it and I have presented it above, suggests five broad themes or concerns that shape the underlying structure of a scientifically informed theology. These relate to (1) scientific methods, (2) scientific accounts of the world, (3) views of reality, (4) the God-world relationship, and (5) the integrity of creation. In this section, I develop these five themes and show that they do, in fact, characterize the basic thrust of the proposals put forward by Peacocke and Polkinghorne in their respective Gifford Lectures. In the section following this one, I will revisit each theme, but with the opposite task of highlighting several important differences between Peacocke and Polkinghorne's work—differences that I will explain in terms of the strategies of intelligibility and credibility.

The first integral theme for theology of nature is a *detailed investigation of scientific methods that does not assume theology must adopt a thoroughly "scientific" mien*. On the one hand, theology of nature is eager to understand the means by which science so successfully garners knowledge of certain aspects of reality and to discern ways in which it can learn from science's success. This desire on theology's part to engage other ways of knowing has been encouraged in recent decades by the ongoing discussion within the philosophy of science about the limits as well as the informal character of the scientific method.²¹ On the other hand, theology of nature will resist a scientific attitude (latent in some versions of natural theology) that takes science to be the only sure way to knowledge. Openness to methodological insights from science need not result in theology relinquishing the methodological wisdom of its own heritage. According to Polkinghorne, such an approach attempts "to do justice to the idiosyncrasy of the discipline

[of theology], while at the same time assimilating it to many other forms of human rational inquiry, including science"; in Peacocke's words, theology "needs to be consonant and coherent with, though far from being derived from, scientific perspectives on the world."²² Theology of nature will also resist ceding too much control to any philosophical system, although it gratefully acknowledges any conceptual clarity philosophy has to offer regarding specific concepts or issues. Both Peacocke and Polkinghorne endorse this attitude toward philosophy and draw a firm distinction between philosophical theism's abstract conception of God and the Christian doctrine of God grounded in the life, death, and resurrection of Jesus Christ. Theology of nature brings to the discussion the full particularity and wealth of its methods and claims even when, through the course of discussion, it becomes clear that certain doctrines must be reformulated or even abandoned.

The incorporation of scientific accounts of the world into theology by engaging science's best-established concepts and theories constitutes the second integral theme for theology of nature. At this level, theology's desire to expose itself to science moves be-

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yond the realm of method and into the realm of scientific theory and theological doctrine. Peacocke expresses the task as follows:

...to evolve a theology that has been refined...in the fires of the new perceptions of the world that the natural sciences have irreversibly established.²³

Polkinghorne, too, articulates his desire for more than peripheral contact when he says:

I am convinced that the discussion must not just be on the frontier between science and theology, but must penetrate as deeply as possible into their heartlands.²⁴

From Big Bang cosmology and evolutionary biology to cognitive neuroscience and genetics, theology of nature takes stock of the full range of recent scientific developments and discoveries when reconsidering the content and relations of the doctrines of God, creation, anthropology, evil, incarnation, salvation, eschatology—indeed, the entire theological agenda.²⁵

The articulation of a rich, differentiated view of reality which simultaneously avoids a dualist view of creation marks the third integral theme for theology of nature. Here, theology takes its stand against reductionist views of the world which aim to strip the human spirit and human experience of their causal powers by labeling them as mere epiphenomena riding on top of what are taken to be the actual ontological and causal structures of

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reality (subatomic particles, fields, and the like), as well as against dualist views which attempt to preserve the causal and theological integrity of human experience by positing a realm of reality, the realm of the spirit, which is separate from the physical world. Charting a course between reductionism and dualism, theology of nature brings to the table its own “data” about the world—what Peacocke calls a tradition’s “accumulated wisdom”²⁶—

including the notion and content of revelation. Given the amount of space Peacocke and Polkinghorne devote to discrediting reductionism, one could fairly say they count it among theology’s most pressing tasks. Polkinghorne devotes the entire first chapter of *Faith of a Physicist*, entitled “Humanity,” to developing a view of reality which makes room for mind and spirit as actors in the world, thus setting the stage for subsequent theological discussion. Polkinghorne’s term for his own view, “dual-aspect monism,” denotes a unified creation which is nonetheless differentiated into two states or phases, the material and the mental. Peacocke makes a somewhat different argument against reductionist claims (more on the difference later), but with similar intentions. He develops a multi-layered view of reality, arguing as follows:

[T]here is no sense in which subatomic particles are to be graded as ‘more real’ than, say, a bacterial cell or a human person or a social fact.²⁷

The richly differentiated human experience of reality, in other words, is a key to the way the world really is. To use Polkinghorne’s expression, “epistemology models ontology.”²⁸ Or as Peacocke puts it, there are good grounds for “believing that what is real is what the various levels of [our] description [of reality] actually refer to.”²⁹ For both Peacocke and Polkinghorne, the nonreducibility of the levels of description we employ implies the impossibility of reducing reality to the constituents of any particular level. Instead, reality must be richly differentiated. At the same time, both affirm the biblical view of the psychosomatic unity of the person and assert that theology must reshape its concept of personhood in accordance with the view that persons are entirely part of the physical world, even though experiences of transcendence are a defining feature of human life.³⁰

The fourth theme central to theology of nature involves *embracing the idea of God's experiencing and suffering with creation in light of the profoundly temporal character of the universe unveiled by contemporary science*. As Barbour indicates, our growing appreciation of the genuinely changing world around us cannot but shape theology because "our understanding of the general characteristics of nature will affect our models of God's relation to nature."³¹ Peacocke and Polkinghorne both respond to the contemporary scientific account of novelty in the world, with its intricate mixture of chance and law, by rethinking the relationship of God to the world in strikingly temporal terms. For each author, God's intimate involvement with the world demands a radical reassertion of divine temporality, even to the point of limiting divine knowledge of the future in light of the world's thoroughgoing temporal character.³² Each draws on the idea of God's self-limitation as a way of understanding not only the world's existence but also its (limited) ability to "make itself." Furthermore, each uses the notion of God's temporal experience of the world as a stepping stone to discuss what is arguably a defining interest of late twentieth-century theology: the suffering of God in and with the world.³³ If God is temporal, then God shares in the experience of the world, including experiences of suffering. A temporal God suffers with a suffering creation. Polkinghorne develops this idea by arguing for the compatibility of divine suffering with divine power. He sees in God's choice to suffer the basis of hope for the world's future through the redemption of suffering itself.³⁴

The affirmation of the integrity of the entire universe in relation to God's purposes constitutes theology of nature's fifth integral theme. The cosmos, this theme affirms, is God's creation. Barbour clearly expresses how crucial it is for theology of nature to redeem and replace the destructive legacy of the traditional, anthropocentric model of human domination over the rest of creation with a more positive view that values the physical

world beyond its utility for human purposes. Along with the biblical theme of the stewardship of nature, Barbour advocates a strongly sacramental view in which God is present in and under all creation.³⁵ It is important to highlight what this theme implicitly affirms, namely, that when theological references are made to the "world" as God's creation, the scope must be broadened to include not only Earth but the solar system, the galaxy, and even the entire universe. Theologians must unlearn "world" and "Earth" as synonyms. Evolutionary biology, astronomy, and cosmology all point to the dynamic and evolving character of the universe, reminding us that the universe as a whole is rightly viewed as God's ongoing creation. In his discussion of revelation, Peacocke argues that what we experience as God's revelation is only a particularly intense form of God's presence which exists at all times and all places in the universe.³⁶ He sees the incarnation as a disclosure of the general meaning and "consummation of the creative and creating evolutionary process" as a whole.³⁷ Theology, for Peacocke, should therefore be "regarded as an exploration of the ultimate meaning of all levels," which comes into focus in the Christ-event.³⁸ Similarly, Polkinghorne uses his dual-aspect monistic view of the universe to guard against the idea that God was less involved in creation prior to the emergence of conscious beings.³⁹ He concurs with Barbour's view that science can help us learn to value the world apart from its utility for our purposes, and when he declares that "the destiny of humanity and the destiny of the universe are together to find their fulfilment in a liberation from decay and futility,"⁴⁰ he echoes Paul's view in Romans 8.

These five themes provide theology of nature with its basic shape. They encourage theological consideration of scientific methods as well as concepts and theories. Even more fundamentally, they promote a reassessment of the entire spectrum of theological considerations in light of science. From this examination of Peacocke and Polkinghorne, both can be seen to engage

the methods and theories of science as they develop their theological proposals. Each takes an integrative view of theology's task vis-à-vis science and brings to this task concerns which distinguish theology of nature from Barbour's other integrationist approaches. Having identified Peacocke and Polkinghorne's common approach under the banner "theology of nature," I now turn to several important differences in their work which are not explained by this shared approach.

III. One approach, two strategies

It is my central claim in this paper that the strategies of *intelligibility* and *credibility* represent two strikingly different strategies for crafting a theology of nature. As such, they stand in close conceptual proximity to one another. The terms might, at first glance, even appear indistinguishable. With the help of Peacocke and Polkinghorne, however, each strategy can be seen to give unique emphasis to the key themes developed in the previous section. First, I need to present definitions of these two strategies.

The strategy of intelligibility develops a theology of nature *by placing scientific accounts of the world in an overall context through an appeal to relevant theological*

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concepts, thereby extending the meaning of these scientific accounts to the most comprehensive level. Intelligibility, in this sense, involves making the broadest possible sense of experience.⁴¹ As a strategy, it aims for more than merely a notional understanding of the world as a purposeful unity. According to Peacocke,

[The scientific quest for] intelligibility concerning the nature and origin of the cosmos has plunged human beings... into the darker stream of the search for meaning.⁴²

The strategy of intelligibility endeavors to offer a deep, satisfying account of the meaning and purpose of the world and humanity as God's creation. In order to give meaning to human experience, this strategy employs a theological framework to support and contextualize scientific descriptions of the world's processes and structures. Accordingly, the strategy begins with scientific accounts of the world and shifts to theological interpretation via questions raised by science but which remain unanswerable within science itself: so-called "limit questions." The strategy of intelligibility, in short, appeals to theology to render the world intelligible. It is important to note that this strategy is radically different from natural theology's strategy of using the world to render God probable. This crucial difference makes intelligibility an important strategy for theology of nature.

In contrast to intelligibility, the strategy of credibility develops a theology of nature *by establishing the tenability of theological claims in light of what science shows us about the*

breadth, depth, and limits of human rationality. Credibility, understood in this way, involves establishing resources for rationally motivated belief. This strategy primarily draws from science's account of the world a picture of human rationality which

allows for, even validates, theological claims and styles of argumentation. In Polkinghorne's words, the strategy of credibility presents an explanation (i. e., warrant or motivation) for religious belief

...comparable to the kind of explanation one might offer of one's conviction that matter is composed of quarks and gluons and electrons.⁴³

It is not that Polkinghorne lacks interest in science's actual account of the world—far from it—but rather that he finds equally interesting, even more illuminating, the epistemological lessons science offers regarding the “how” and “why” of our beliefs about God and Creation. The strategy of credibility, in short, appeals to science to render God credible. As a strategy, it too differs markedly from that of natural theology. Instead of setting its sights on proving the existence of God, it endeavors to motivate, deepen, secure, and inevitably refine existing belief in God in light of what is known about how the world has come to be apprehended through science.

Theology of nature has (at least) these two strategies available to it: (1) to employ theology to extend the intelligibility of world as we know it through science, and (2) to employ the epistemological lessons of science to strengthen the credibility of theological claims about God, humanity, and the cosmos. With these definitions in hand, the differences between Peacocke and Polkinghorne begin to appear more clearly. A quick review of the epigraphs at the beginning of this paper will perhaps now yield not only a sense of the distance between Ritschl's concerns and those of Peacocke and Polkinghorne, but also an increased appreciation for the differences between a theology that intends to make “the science of its times” intelligible and one that intends to establish the credibility of the “strange and exciting” claims of theology in light of science. Several specific examples of Peacocke and Polkinghorne's implementation of these strategies paralleling the themes of the previous section will help to shed further light on their differences.

Peacocke and Polkinghorne have similar views of the way science works—both are influenced by (and express similar reservations about more constructivist versions of) recent work in the philosophy and history of science—and yet each casts the methodological import of science in strikingly different language. For Peacocke, “theology, like any other human inquiry into the nature of reality, must use the same general criteria of rea-

sonableness as, say, science itself.”⁴⁴ Among the criteria he lists are: fit with data, internal coherence, comprehensiveness, cogency, simplicity, fruitfulness, and (for theology) giving meaning for personal existence. Theology, says Peacocke, “cannot avoid running the gauntlet of these criteria of reasonableness...”

⁴⁵ His is by no means a positivist view of science, and yet he insists that theology strictly adhere to a set of general criteria in order to contribute to the quest for intelligibility.⁴⁶ Polkinghorne, on the other hand, focuses on the richness of human rationality by pointing repeatedly to parallels and analogies between scientific and theological methods regarding issues such as the role of unique events in advancing knowledge, the necessity of complementarity as a tool for describing reality, the place of dynamism in the being of God and creation, the difficulty of theory choice in the absence of crucial experiments, and the need for “corrigible boldness” in both cosmology and New Testament studies.⁴⁷ Although one might think Polkinghorne's professed “bottom-up” scientific approach to theology would be compatible with Peacocke's concern to establish general criteria of reasonableness, Polkinghorne is in fact more concerned to ensure continuous contact between theology and the details of human experience than he is to confine theology inside any sharply defined methodological boundary.⁴⁸ Thus, while the strategy of intelligibility is to demand that theology meet various general criteria of rationality, the strategy of credibility is to develop a view of rationality rich enough to encompass theological patterns of thought and broad enough to reveal parallels between theological and scientific modes of reasoning.

Peacocke and Polkinghorne are notably divided over the implications of scientific knowledge concerning biological reproduction for the theological issue of the Virgin Birth, or more precisely stated, the issue of Jesus' virginal conception. According to Peacocke, for Jesus to have been “fully human” he must have had a human father. Biological science tells us that without a Y chro-

mosome—which only males can pass on, and which only they inherit—Jesus would not have been born male. Jesus, like all men, must therefore have inherited a Y chromosome from a human father.⁴⁹ If theology is to make sense of the special character of the person of Jesus by appealing to the notion of incarnation, Peacocke contends that it will have to do so within the confines of our understanding of biological reproduction. Although Polkinghorne alludes to the difficulty posed by the issues Peacocke raises for a bottom-up thinker like himself, he nonetheless defends the Virgin Birth on the basis of scriptural considerations together with the “symbolic appropriateness of the fusion of divine initiative and human co-operation.”⁵⁰ Thus, although both authors acknowledge the relevant scientific issues, Peacocke insists that if theology is to contribute to the intelligibility of the Virgin Birth, it must play the hand it has been dealt by science, while Polkinghorne defends the credibility of the narrative, even though it appears to be a biological impossibility.

In spite of the fact that both Peacocke and Polkinghorne articulate a rich, differentiated view of reality, they have strikingly different views of the human person, which reflect their different theological strategies as much as their commonly held anti-reductionist convictions. Peacocke, for instance, develops a detailed hierarchy of reality (with corresponding sciences) as part of his argument against a dualistic view of the human person and for a view of the person as a “microcosm” of the multi-leveled, but thoroughly physical, “macrocosm.”⁵¹ Peacocke’s claim that human beings are made of the very stuff of the world undergirds his idea that God’s interaction with humanity is only a more intense form of God’s interaction with the world in general.⁵² Polkinghorne, on the other hand, is more concerned to construct a metaphysical view that includes from the outset realities such as mentality and free will. His own “ample and many-valued view of human nature” builds on his discussion of the ideas of complementarity and openness, which, he ar-

gues, point to a world of becoming in which “there are opportunities for the action of causal principles, other than the merely mechanical interaction of parts.”⁵³ Whereas Peacocke presumes the sufficiency of known natural processes to explain personhood, Polkinghorne suggests a degree of novelty and receptivity in nature beyond what science can presently describe. By appealing to processes not within the reach of current science, Polkinghorne argues for the credibility of a more traditional theological anthropology on the basis of the continual advance (and abandonment) of scientific theories. Peacocke, on the other hand, takes the best available science as a relatively adequate account of persons within which theology must operate as it attempts to make the concept of personhood intelligible.

A key point of difference between Peacocke and Polkinghorne lies in their estimation of God’s relation to the world. Peacocke argues for a panentheistic view:

[T]he processes revealed by the sciences are in themselves God acting as Creator. . . . God is not to be found as some kind of *additional* factor added on to the processes of the world.⁵⁴

God, in Peacocke’s panentheistic view, is (but is not limited to) the world considered at its most comprehensive level. Because God *is* natural processes acting in themselves, these processes are rendered amenable to meaning and purpose; that is, they can be made *intelligible*. By contrast, Polkinghorne describes the relation between God and the world in more traditionally theistic terms. Although he accepts a kind of eschatological pantheism, he calls the regularities of nature at best a “pale reflection of the faithfulness of the Creator” and is unsatisfied with Peacocke’s equating natural processes with God’s action.⁵⁵ Instead, he prefers to reshape the traditional view of divine action by interpreting novelty and change in nature as a consequence of God’s allowing creation to be itself. Rather than making natural processes intelligible by equating them with God’s action, Polkinghorne attempts to present a credible version of God fulfilling the divine pur-

poses in the world by blending the idea of God allowing nature to develop under its own integrity with the idea of God working in and through nature's openness.

Perhaps one of the most striking differences between Peacocke and Polkinghorne centers on their disparate views of the relation of the "Empty Tomb" to the resurrection. Given Peacocke's view that theology must conform to the standards of rationality adhered to by science, it is not surprising that he prefers to remain agnostic about the empty tomb, arguing instead for a notion of resurrection that does not dispute the finality of biological death. In light of the loss of continuity that accompanies death, through the decay and dispersal of the body's molecules, Peacocke argues that resurrection should be understood as a re-creation or transformation that does not depend upon bodily continuity.⁵⁶ He opts to make the notion of death and a "victory over death" intelligible by developing his interpretation of resurrection independent of any consideration of physical transformation. According to Peacocke, Jesus' resurrection can be relevant to us—as beings whose bodies disperse upon death and eventually contribute to future life, even human life—only if we can be resurrected in the same manner as Jesus was. If Jesus' resurrection depended on the transformation of his physical body before decay had set in, an "insuperable, logical gulf" lies between us and him.⁵⁷ Peacocke argues that resurrection cannot depend upon bodily continuity and must, for Jesus and for us, constitute a "re-creation into a new mode of existence."⁵⁸ For Polkinghorne, the empty tomb of the resurrection proleptically announces the common eschatological destiny of humanity and all creation.⁵⁹ Although theology has, over the centuries, been rather ambiguous about nature's place in the consummation of creation,⁶⁰ Polkinghorne offers an account of

Christian hope that establishes the credibility of the traditional theological claim of bodily resurrection by linking the transformed materiality of the resurrected Christ to the materiality of all creation. Peacocke, as I have shown, retreats from the traditional claim of bodily resurrection in his choice to situate the irreversible finality of physical death within the context of hope in God's ultimate affirmation of personhood.

Other examples could be adduced as well, but these five suffice to establish my claim that although Peacocke and Polkinghorne share a set of concerns that motivate their interest in theology of nature, they have strikingly different strategies for pursuing their work. Within Peacocke's strategy of intelligibility, the methods and ideas of science act as a tether on theological claims. One does occasionally find him employing the limits of science in support of theological claims, as in this remark:

[U]ltimate ineffability in the nature of the divine parallels...our ultimate inability to say what even things and persons *are* in themselves.⁶¹

In general, however, he emphasizes the constraining role of science upon theology. Polkinghorne's strategy of credibility allows theology considerably more room to maneu-

Peacocke insists that if theology is to contribute to the intelligibility of the Virgin Birth, it must play the hand it has been dealt by science, while Polkinghorne defends the credibility of the narrative, even though it appears to be a biological impossibility.

ver. His willingness to portray not only the strengths of the scientific method but also its limits yields a broader concept of human rationality designed to accommodate and support a wider range of theological claims. Significantly, Polkinghorne himself makes the

following comment about the relation between his own approach and that of Peacocke:

At issue [between Peacocke and myself] is the degree to which scientific concepts should be allowed to mould and influence the conceptual apparatus of theological thought, and the degree to which theology must retain (as science does unquestioned) its own portfolio of irreducibly necessary ideas.⁶²

This is precisely the issue I have developed through my discussion of the strategies of intelligibility and credibility.

IV. Theology of nature's dilemma

In my argument that Peacocke and Polkinghorne employ distinct strategies for

developing a theology of nature, two noticeably different ways of understanding what it means to "take science into account" have emerged. According to the strategy of intelligibility, theology ought to focus primarily on the actual details of scientific accounts of the world

(scientific concepts and theories) and adjust itself accordingly, in order to participate fully in the human quest for meaning. On this account, theology should place heavy emphasis on incorporating scientific accounts of the world—the second theme of a theology of nature—and allow science to act as a constraint upon theology, pruning concepts and doctrines according to their congruence with scientific description. In contrast, credibility emphasizes detailed investigation of scientific methods (the first theme of a theology of nature) in order to equip theology with a more nuanced understanding of the inner workings of science and of the rich resources of human rationality, and thus to embolden theology in its defense of theological claims. On this account, science is understood to offer support to theology by contributing to a better understanding of the breadth and depth of human

rationality and its capacity to encompass and sustain theological reasoning. Having presented my argument, I now want briefly to explore the relation between these two strategies. The obvious tension between them leads to the question of whether it is possible to decide which strategy is preferable. Ought one strategy be chosen over the other? And what considerations might enter into such a decision?

I propose dubbing the tension between these two strategies the "science dilemma," because, in fact, science *itself* pulls theology of nature in both directions. Or put more precisely, actual scientific accounts of the complex and interconnected world seem to encour-

Should theologians attempt to restructure theology along lines more consonant with scientific views, or should they resist such consonance, knowing that science, properly chastened, is not capable of vetoing theological claims, no matter how unlikely or strange?

age theological engagement, while careful examination of the processes of science (provided by recent philosophy of science) suggests that theology is justified in adopting a critical, self-confident, even self-reliant, attitude toward science and its description of the world. For any given point of apparent conflict between theological and scientific accounts of the world, the dilemma immediately appears: should a particular theological concept or doctrine such as physical resurrection be reinterpreted, revised, or abandoned in light of scientific knowledge, or should theology resist the implications of the relevant scientific account? More generally, should theologians attempt to restructure theology along lines more consonant with scientific views, or should they resist such consonance, knowing that science, properly chastened, is not capable of vetoing theological claims, no

matter how unlikely or strange? What criteria might help in deciding between these two strategies? The historical irony here is that while numerous scientific developments of the twentieth century have stimulated a desire among theologians for bridge-building—in ways that would have been unthinkable for Ritschl—the methodological tools carefully assembled by theologians for entering into dialogue with the sciences have often seemed better suited for constructing observation towers than for building bridges.⁶³

Furthermore, these two strategies present a dilemma for theology of nature rather than a straightforward choice because when taken individually, each strategy comes with considerable risks. While the strategy of intelligibility “plays fair” with scientific accounts of the world by allowing science to constrain theology, uncritical acceptance of this strategy hazards a theological capitulation to science that would ultimately disallow theology its central claims (such as physical resurrection). The strategy of credibility, on the other hand, correctly points us to a broader notion of human rationality, but a wholehearted embrace of this strategy raises the possibility of unduly immunizing theology against science’s ability to safeguard our fallible epistemic endeavors from untethered conjecture (regarding, for example, the Virgin Birth).⁶⁴ The tension between these two strategies resists easy resolution. As a result, together they pose a genuine dilemma for the construction of a theology of nature.

Is there somewhere to turn for help in resolving this dilemma? Fortunately, a good deal has been written on the relation between science and theology in recent decades. To name only some of the more prominent figures who have written on this subject, I would mention Michael Banner, Ian Barbour, Philip Clayton, Niels Gregersen, Sallie McFague, Alister McGrath, Nancey Murphy, Wolfhart Pannenberg, Wentzel van Huyssteen, and Mikael Stenmark. Might these authors provide a way out of the science dilemma? I believe the answer is, unfortunately, no, though some have more to offer than others.

In spite of the diversity of views and approaches taken by these authors, none offers an entirely satisfactory solution to the problem. Although it is beyond the scope of my argument in this paper to warrant this claim in detail, a brief summary will suffice to show why I believe these authors do not provide a solution to the science dilemma.

Much recent writing on the relationship between science and theology has taken the form of investigating the developments of twentieth-century philosophy of science, and then applying these developments to the issue of theological method. Given the difficult situation theologians faced in the middle of the twentieth century regarding the cognitive status of their claims, this was no doubt the best place to begin. The downfall during this period of the logical positivist paradigm of knowledge, which had reigned supreme during the early part of the twentieth century and which condemned theology outright as non-empirical and thus meaningless, meant that the most pressing task with regard to the relationship between theology and science was to marshal resources for reclaiming the integrity of religious belief and theological rationality. Two examples of this approach include early works by Barbour and Pannenberg.⁶⁵ Although each of these authors elsewhere engages the actual findings of science,⁶⁶ neither included in their discussion of the methodological characteristics and relationships of theology and science anything that might shed light on the science dilemma. Pannenberg, for example, in his magisterial *Theology and the Philosophy of Science*, dealt at length with the question of whether theology can be called a science, but nowhere attempted to develop a set of principles for clarifying whether or how theology should incorporate knowledge from the sciences. Barbour’s discussion of the philosophy of science in *Myths, Models, and Paradigms* defended the referential character of religious language in light of recent philosophy of science, but did not go on to provide any sort of framework for enabling the critical interaction of scientific and theological concepts.

Building on Barbour and Pannenberg's early insights, others have followed a similar pattern in discussing the methodological relations between science and theology: introduce the thesis that theology "must take science seriously," but then develop it by arguing for the explanatory power and integrity of theology based upon a careful and critical interpretation of philosophy of science without any detailed discussion of how theology should critically engage the concepts and theories of science. Banner, for example, meticulously reviews developments in twentieth-century philosophy of science in arguing for the existence of parallels between scientific and theological methodology.⁶⁷ Clayton, following Pannenberg, focuses on the mediating role of the social sciences by constructing an epistemological continuum that would link types of knowing found in the physical sciences and theology.⁶⁸ McFague's insightful examination of the role of metaphor in theology draws on the place of metaphor in scientific discourse, but her work is largely devoid of reference to actual scientific accounts.⁶⁹ Similarly, van Huyssteen focuses in his early work on the quest for "epistemological credibility," through a careful discussion of philosophy of science; but he offers few references to actual scientific theories.⁷⁰ Nancy Murphy's discussion of theology's options for interacting with science mentions two strategies similar to those I have here designated as the science dilemma: (1) hybridization resulting from the incorporation of scientific theories into theological formulations, and (2) competition resulting from theology presenting its own view (e.g., of religious experience) as an alternative to a secular scientific account of the same phenomenon—but, again, she puts forward no criteria for considering what might make one option more appropriate than the other.⁷¹ In a more recent contribution—which, disappointingly, breaks little new methodological ground—McGrath looks for points of methodological divergence as well as convergence, but concludes minimally that belief in God can be maintained in light of what science tells us (e.g., about the place of evil

and suffering in the world).⁷² Stenmark's recent helpful discussion of rationality in light of the epistemic limits encountered in everyday life likewise offers no insight for discerning how theological beliefs should be constrained by science, beyond arguing that all belief should remain open to criticism.⁷³ Gregersen, too, has no answer to the science dilemma; but he does at least lay hold of its basic structure:

[T]heology always runs the double risk of either conflating theological and scientific language or of prematurely putting barriers to the coherence process.⁷⁴

Despite much careful reflection and important insight into the relation between science and theology, none of the works mentioned above manages to go beyond an initial call for critical dialogue.

Nonetheless, this body of literature has succeeded in taking what must be considered a crucial step toward re-establishing connections from theology to science. The importance of these authors' insights regarding the philosophy of science vis-à-vis theology cannot be overestimated, especially in light of logical positivism's previous dismissal of theology, and neo-orthodoxy's subsequent refusal to engage science at all. And yet, in spite of this genuine advance, no set of criteria has appeared for deciding when theology should undertake to revise its claims in light of science and when it ought to resist such intrusions—the dilemma remains.

In light of the fluid nature of both theology and science, is it even feasible to ask for criteria for a critical theological appropriation of science? Granted, the task of exploring the degree to which science and theology—both living and changing traditions—share a common or analogous epistemology and draw from the same resources of human rationality is never finished. Nonetheless, theology's engagement with scientific concepts and theories cannot be postponed in anticipation of a definitive methodological account of their processes and relationship. Theology in the past has made better and worse assumptions

about the physical world, and it will continue to adopt a particular working understanding of the processes and constituents of the world. If theologians cannot avoid the difficult task of responsibly appropriating scientific insights into theology, perhaps it is wise to see if recent insights can be leveraged in order to clarify what “responsibly” means.

In this regard, it is helpful to revisit the work of Philip Clayton, who in his *Explanation from Physics to Theology* asks what might count against theological assertions that appear to contain empirical claims, but which may not be immediately testable (e.g., the resurrection). Clayton lists three criteria: (1) internal contradiction, (2) empirical predictions that are falsified, and (3) tension between a theological assertion and the corresponding natural explanation.⁷⁵ Clearly, the second criterion appears to be a remote possibility for theology in most cases, but this may be an area in which theology should endeavor to adopt a more “scientific” character (depending, of course, on whether one opts for a more redescriptive view of theology, such as Gregersen’s, or a more boldly predictive one, such as Murphy’s). With regard to (3), unfortunately Clayton does not describe in detail the degree or kind of tension that would count against a theological assertion. He does, however, make the important observation that religious beliefs can never be evaluated individually, given the contextual constraints and demands inherent in theology.⁷⁶

In his most recent work, *God and Contemporary Science*, Clayton provides a more sustained answer to the question of what it means to take science seriously. Like Gregersen, he has a basic grasp of the science dilemma: the relevant theological goal, he says, is to develop a theology constrained, but not dictated by science.⁷⁷ He suggests several criteria for a responsible theological engagement with science: (1) openness to

scientific results and the directions they point, (2) willingness to wrestle with tendencies that run counter to traditional theological answers, and (3) openness to revising dearly held theological conclusions. He goes on to specify two options for theology when faced with the task of rejecting the apparent implications of science: either (4) search for other reasons inherent within the sciences themselves to support the theological claim,⁷⁸ or (5) locate reasons that might be convincing from other fields such as history, ethics, or philosophy. Finally, he adds (6) the obligation to avoid misusing science by attempting to “prove” theological claims which ultimately must be judged on the basis of their theological adequacy (which will include, but not be limited to, taking their congruence with science into account).⁷⁹

What should be made of Clayton’s approach in relation to the present concern? While his criteria are helpful in evoking the attitude that theology of nature must hold toward science, and while he elucidates options for theology of nature if it chooses to remain in tension with science, the issue of whether to adopt or resist a particular scientific concept or theory remains hidden in the move-

The central challenge for theology of nature is to avoid either inappropriately resisting science when it should be embraced, or inappropriately embracing science when it ought to be resisted.

ment from criterion (3) to (4). In fact, Clayton thinks that an informed understanding of scientific conundrums and limits points to the need for a broader metaphysical discourse, a common framework for formulating agreements and disagreements, without which no further clarification can be attained on this issue. Having developed in this paper two strategies for theology of nature, which as an approach to integration explicitly rejects the idea of a relying upon a broader philosophi-

cal schema, to arrive now at an apparently unresolvable dilemma suggests that Clayton may indeed be right. Whether or not his approach could be successfully implemented without slipping into “systematic synthesis” is an issue that needs to be engaged, though I cannot address it here.

Why has the search for criteria by which to mount a critical theological appropriation of science proven so difficult, the criteria so elusive? In addition to Clayton’s suggestion of the need for a broader metaphysical framework, I would like to conclude by drawing attention to one other possibility. Perhaps some clarity can be gained by rephrasing the concern. Instead of asking, “What constitute adequate criteria for a critical appropriation of science?” one might ask, “What would ensure the rationality of a theological decision to adopt or resist a particular scientific viewpoint?” As I have noted, the central challenge for theology of nature is to avoid either inappropriately resisting science when it should be embraced, or inappropriately embracing science when it ought to be resisted.

Wentzel van Huyssteen, in his discussion of Harold Brown’s treatment of rationality, emphasizes the key role of judgment in all human cognition and argues for the impossibility of obtaining a guarantee or achieving certainty when faced with the choices presented by the science dilemma. Although criteria such as those being sought here may aid in decision-making processes, a shift from a rules-based understanding (or a criteriological conception)⁸⁰ of rationality to a judgment-based understanding locates rationality squarely within the agent who is making decisions, rather than in the logical relations between evidence and belief; such a shift seems to preclude any neat resolution to the science dilemma.⁸¹ In accordance with van Huyssteen’s view, Fraser Watts makes the following assessment:

[The search for and deployment of] clear ground rules for evaluating how well particular theological accounts and scientific accounts sit alongside one another...[will] be a matter of judgment

rather than of strict logic, not unlike the judgments scientists routinely make about how well a particular scientific theory sits with a body of data.⁸²

Clayton, too, seems to agree that the process of judgment, which he defines as the formation of a “cognitive attitude,” is ultimately beyond the grasp of any rules-based rationality.⁸³ For these authors, the human person and community emerge squarely at the center of the decision-making process, whether in science or theology. According to Calvin Schrag, what is needed, and in fact what an examination of human rationality shows we have, is the use of “criteria without criteriology.”⁸⁴ In light of this important insight into the nature of human rationality, it would appear that any set of criteria one might develop can play only a supportive role as theology of nature seeks to be informed by science.⁸⁵

Conclusion

As the need to include the accumulated wisdom of science within theological patterns and methods of reflection grows ever more pressing, appropriate means must be developed for critically engaging scientific methods, concepts, and theories. The approach identified in this paper, theology of nature, with its interest in scientific methods and accounts, its rich view of reality, its sense of God’s engagement with creation, and its insistence on the significance of all creation for God’s purposes, is well suited to the challenge of crafting a scientifically informed view of God, humanity, and the world.

Within this general approach, however, the strategies of intelligibility and credibility represent two different impulses: one to make sense of the world in which we live, and the other to make sense of the God in whom we live. These strategies stem from the same impulse—a desire to make sense of the connection between God and Creation—but move in opposite directions, one wanting to tether theological thought to the world as it is known through science, and the other wanting to abstract lessons from science about human rationality to yield a more expansive view of the rational resources available for theologi-

cal reflection. In addition to adding a layer of clarification to Barbour's typology, the strategies of intelligibility and credibility provide a lens for understanding the related, but distinct theological agendas of Peacocke and Polkinghorne in their Gifford Lectures. The difficulty of establishing criteria by which to evaluate the merits of these strategies in relation to particular points of contact between theology and science constitutes what I have called the *science dilemma* for theology of nature. Whether or not the central role of judgment in the processes of human rationality precludes any neat resolution to the dilemma posed by these strategies is a question that demands further investigation. Nonetheless, in identifying these strategies and in pointing to the unresolved nature of their relationship, this paper has clarified theology's task as it seeks to develop a robust view of God, humanity, and the world in light of what is known through science.

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Endnotes:

1. Ritschl, vol. 3, p. 20.
2. Peacocke, *Theology for a Scientific Age*, p. 7.
3. Polkinghorne, *The Faith of a Physicist*, p. 7.
4. For an original and insightful reading of Kant—and Hegel, as well—on the problem of relating nature to spirit in light of the rise of modern science, see Galloway.
5. When Darwin published his controversial theory of biological evolution in 1859, the problem of relating spirit to nature was already firmly ensconced in the modern theological mind. The notion of common decent among species did, however, intensify this problem by inaugurating a detailed investigation into the connections between human and natural history. The variety of theologi-

cal responses to Darwin's theory is summarized in Welch, ch. 6, especially pp. 198-208.

6. In Ritschl's own words, nature's "lack of kinship with God" meant that it could not be "the direct object and the last end of his loving will" (Ritschl, pp. 219-28).

7. Jürgen Moltmann has commented succinctly on theology's retreat into the human realm: "Ostracized from cosmology by the natural sciences, Christian theology became anthropology" (Moltmann, p. 205).

8. See, for example, Green, pp. 3-22; and Polkinghorne and Welker.

9. On the question of natural theology, Polkinghorne suggests that although its focus on human reason rather than divine revelation has in the past led to perversions such as the "German theology" developed by part of the Church under Hitler, a genuine form of natural theology could nonetheless be integrated "with the rest of theological discipline in a single endeavor to learn of God" (*Faith of a Physicist*, pp. 42-43). Peacocke notes that natural theology has correctly been interested in what the sciences have to say about the world, even if God's presence has sometimes "been too readily discerned in details of the world's phenomena" (*Theology for a Scientific Age*, p. 99).

10. Barbour's typology also appears in chapter 4 of *Religion and Science*, which is a recently published revised and expanded version of his widely used *Religion in an Age of Science*. In his typology, the conflict and independence views share an oppositional understanding of the relation between religion and science, but independence avoids interaction by demanding strict separation between scientific and religious spheres of knowledge, whereas conflict sees only inevitable feud. Dialogue and integration share a more conciliatory attitude, but integration goes beyond dialogue's interest in comparing the general features of science and religion by developing direct relations between theological doctrines and scientific theories. For other typologies developed in response to Barbour's, see Haught, and Peters. It is help-

ful to remember that the use of the term "dialogue" in the conventional phrase "theology-and-science dialogue" refers to the interdisciplinary character of the discussion, not to the specific meaning Barbour reserves for the term "dialogue" in his typology (more on this below.)

11. Peacocke and Polkinghorne employ a wide range of terms to describe their approaches. Although both authors use the terms "intelligibility" and "credibility" through their writing, my choice to associate one term with a particular author reflects the differences I wish to highlight. Of course, neither strategy implies the other's negation: intelligibility does not imply incredibility any more than credibility implies unintelligibility.

12. A question related to but beyond the scope of this paper is whether theology can be understood as having legitimate reciprocal influence upon science. The challenge of creating a genuinely two-way interaction between theology and science is plagued with difficulties and dangers, but it is a question that any theology taking itself seriously as a description of reality cannot avoid. My discussion here assumes an explanatory role for (or cognitive dimension to) theology while acknowledging that theology plays other roles as well, such as expressing personal and social desires in the language of faith, guiding human conduct, and bringing a sense of meaning to life. This paper focuses specifically on characterizing two options available for a theology which wants to be informed by science but which takes its task to be more than mere redescription of the world given through science.

13. It should be noted that I am drawing on Peacocke and Polkinghorne for the specific purpose of identifying and characterizing these strategies. Thus, I do not provide an overview of Peacocke's or Polkinghorne's larger contribution to the theology-and-science dialogue, or even of the contribution they make in their Gifford Lectures. Neither do I argue that one finds the strategy of intelligibility, for example, consistently implemented across Peacocke's writings, or that either

author's theological views follow logically from the strategy he employs. An extension of my project might examine the historical development of Peacocke's and Polkinghorne's views on this issue. In Peacocke's writings, for example, I suspect one could observe a shift from an early affinity to natural theology to a later emphasis on theology of nature. Peacocke's use of the term "credibility" in the title of a more recent (1996) work, *God and Science: A Quest for Christian Credibility*, seems to suggest a further shift in his approach; but as it turns out, this short book is essentially a condensed version of *Theology for a Scientific Age* and shows no shift away from the strategy of intelligibility. In the preface of this book, Peacocke suggests that his approach is "not so much 'faith seeking understanding' [as with Polkinghorne and the strategy of credibility]...but rather 'understanding seeking faith'" (p. viii).

14. For Barbour's own discussion of integration, see his *Religion and Science*, pp. 98-105.

15. As of late, those allied with the Intelligent Design movement are attempting to revive the argument from structural complexity by appealing to the notion of improbability. Even if this strategy is ultimately judged to be successful—and I am doubtful that improbability is a helpful concept in the context of unrepeatable historical events—it would be no less susceptible to Hume's criticism than was the work of the seventeenth and eighteenth century British natural theologians: a gap remains between the relatively abstract notion of the existence of a divine designer and a particular understanding of, say, the Christian or Jewish God.

16. Barbour, op. cit., p. 105.

17. Ibid.

18. Ibid., p. 360.

19. For "theology of nature" in the narrower sense, i. e., assessment of the place of the natural world in Christian thought, see Santmire's work in *The Travail of Nature*, and *Nature Reborn*. For other examples of the term "the-

ology of nature" used in distinction from "natural theology," see Hendry; and Pannenberg, *Toward a Theology of Nature*. It would perhaps be better for me to employ a new term here and keep "theology of nature" for reflection on the natural world in the narrower sense. For the time being, however, I have chosen to retain Barbour's terminology rather than adopt a more accurate but awkward term such as "scientifically informed theology."

20. I take this phrase from the title of the helpful assessment of the status of Christian belief in contemporary scientific culture provided by Allen: *Christian Belief in a Postmodern World: The Full Wealth of Conviction*. Similarly, van Huyssteen contends that we should be able to enter the interdisciplinary conversation between science and theology "with our full personal convictions, while at the same time stepping beyond the strict boundaries of our own intellectual contexts" (p. 33).

21. For a brief but clear survey and assessment of twentieth-century developments in the philosophy of science, see Jiang Tianji.

22. Polkinghorne, *Faith of a Physicist*, p. 46; Peacocke, *Theology for a Scientific Age*, p. x.

23. Peacocke, loc. cit.

24. Polkinghorne, op. cit., p. 7.

25. Theological interest in scientific methodology carries with it the benefit of increasing our general awareness of the fallibilist, hypothetical nature of all human knowledge. Although a theologian may reasonably engage the best-established scientific concepts and theories of the day, those with a special interest in and familiarity with science need to lead the way in the quest for theological provisionality, which will not only require theologians to work in a more fallibilist mode but may also bring them into proximity with more speculative scientific theories. To emphasize the hypothetical nature of theological statements is not to deny the commitment of religious faith, but rather to call attention to the fact that assent to theological claims

need not be taken to be inimical to an attitude of openness to criticism. Full acceptance of a particular belief need not entail absolute disregard for any future counterevidence. Holding one's commitments as "hypotheses" also comes from acknowledging that thoughtful people hold differing views. On this issue, see Murphy; van Huyssteen, *Theology and the Justification of Faith*, p. 83; Clayton, *Explanation from Physics to Theology*, pp. 140-41; Rescher, p. 121; and Stenmark, p. 295.

26. Peacocke, op. cit., p. 18.

27. *Ibid.*, p. 41.

28. Polkinghorne, *Faith of a Physicist*, p. 156.

29. Peacocke, op. cit., p. 41; cf. pp. 224-25.

30. *Ibid.*, p. 160-63; Polkinghorne, op. cit., p. 163.

31. Barbour, *Religion and Science*, p. 101.

32. Peacocke, op. cit., p. 131; Polkinghorne, op. cit., pp. 61-63.

33. See Placher, for example.

34. Polkinghorne, op. cit., p. 62; compare to Peacocke, op. cit., pp. 126-27, in which God is even more closely associated with the suffering of the world.

35. Barbour, op. cit., pp. 102-3.

36. Peacocke, *Theology for a Scientific Age*, p. 181.

37. *Ibid.*, p. 306.

38. *Ibid.*, pp. 314, 23.

39. Polkinghorne, *Faith of a Physicist*, p. 69.

40. *Ibid.*, pp. 86, 164.

41. Peacocke, op. cit., p. 87.

42. *Ibid.*, p. 5.

43. Polkinghorne, op. cit., p. 6.

44. Peacocke, op. cit., p. 91.

45. *Ibid.*, p. 18.

46. Joseph Rouse has argued, perhaps a bit too strongly, that "there are no generally applicable standards of rational acceptability in science. There is only a roughly shared understanding of what can be assumed, what can (or must) be argued for, and what is unacceptable for any given purpose and con-

text" (p. 124). In general, though, I find helpful Rouse's attempt to articulate a mediating philosophical position between the resistance of Continental philosophy to the totalizing posture of science and the Anglo-American inclination to accept science as the example par excellence of rationality. His balanced postmodern philosophy of science adroitly draws attention to the difficulty of applying standards with such a high level of generality as those identified by Peacocke. In section IV, I call attention to the limitations of a criteriological approach to rationality, regardless of the level of generality.

47. Polkinghorne, op. cit., pp. 6, 25; chapter 2, passim, particularly pp. 53, 59, 70, 89.

48. For Polkinghorne's own characterization of bottom-up versus top-down thinking, see *ibid.*, p. 11.

49. Peacocke, *Theology for a Scientific Age*, pp. 275-79. Or, as he says elsewhere, Jesus "must be not only flesh of our flesh and bone of our bone, but also DNA of our DNA" (*God and Science*, p. 76).

50. Polkinghorne, op. cit., pp. 144-45.

51. Peacocke, *Theology for a Scientific Age*, pp. 214-48.

52. *Ibid.*, pp. 211.

53. Polkinghorne, op. cit., p. 26.

54. Peacocke, op. cit., p. 176, emphasis original.

55. Polkinghorne, op. cit., p. 78.

56. Peacocke, op. cit., pp. 285ff.

57. *Ibid.*, p. 332.

58. *Ibid.*, p. 285, emphasis original. Peacocke is undoubtedly right in arguing that resurrection cannot depend upon atom-for-atom bodily continuity. But it does not follow from this that materiality has only a preliminary role to play in God's purposes regarding the fulfillment of creation, a view that Peacocke seems generally inclined to accept in *Theology for a Scientific Age*. Jesus, according to Peacocke, defines humanity, "not by its origins in the physical, biological and social worlds but in terms of what God intends humanity to become. In and through

Jesus the Christ we have come to see what human personalness can amount to. In his life and death, and supremely, in his resurrection, we see...the immanent Creator [bringing] created personalness out of materiality into the divine life” (p. 344). Granted, Jesus marks the fulfilment of humanity, but why limit Jesus’ action to creating “personalness out of materiality”? If, as Peacocke has previously argued, there is no basis for asserting that any particular level of reality is “more real” than any other, why dismiss the idea of a common destiny for the whole created order, “splendid though such a hope would be” (p. 285)? My judgment here is that Peacocke’s lingering anthropocentrism works against his broader theology-of-nature agenda—as when, for example, he employs the controversial notion of nature’s “propensity” for manifesting consciousness to argue for “the emergence of self-conscious persons...as the intention of God continuously creating through the [natural] processes” (p. 221; see also pp. 62-69). Polkinghorne, despite generally being the more theologically traditional of the two, more consistently renounces this anthropocentrism. Peacocke’s Christ lacks the cosmic import one would expect from such a detailed and profound vision of God’s involvement in the world as one finds in *Theology for a Scientific Age*.

59. Polkinghorne, *Faith of a Physicist*, p. 164.

60. See Galloway; and more recently, Santmire, *The Travail of Nature*.

61. Peacocke, *Theology for a Scientific Age*, p. 102, emphasis original.

62. Polkinghorne, *Scientists as Theologians*, p. 82.

63. The relationship between these two strategies is identified in somewhat different language by Schrag, who refers to “the dialectics of participation and distanciation” (p. 65) in his discussion of the “transversal” nature of rationality. Although the dynamism implied by the word “dialectics” makes his an apt characterization of the movement of the rational agent’s engagement with multiple intellectual communities and discourses and across disciplinary boundaries, I use the term

“dilemma” to signal my unwillingness to accept the lack of precision implied by the term “dialectics” for the problem of relating intelligibility and credibility.

64. A self-serving assessment of the philosophy of science completely devoid of Polkinghorne’s sophistication is given in a brief review of Thomas Kuhn’s well-known *The Structure of Scientific Revolutions*, found in the article entitled “The Greatest Books of the Twentieth Century,” printed in the fundamentalist magazine *World* (July 3/10, 1999): “Kuhn showed why Christians do not have to fear science anymore. It keeps changing.” More sophisticated but equally appreciative of Kuhn’s insights on rationality, George Lindbeck writes, “Reason places constraints on religious as well as on scientific options even though these constraints are too flexible and informal to be spelled out in either foundational theology or a general theory of science” (p. 131).

65. Barbour, *Myths, Model, and Paradigms*; Wolfhart Pannenberg, *Theology and the Philosophy of Science*.

66. See, for example, Barbour, *Issues in Science and Religion*, esp. Part III; Pannenberg, *Toward a Theology of Nature*.

67. Banner.

68. Clayton, *Explanation from Physics to Theology*. A similar discussion of the hermeneutical character common to all science, but one which does not touch on the topic of religious belief, can be found in Rouse.

69. McFague.

70. van Huyssteen, p. 196.

71. Murphy, pp. 198-99.

72. McGrath, pp. 94-98. It remains to be seen how McGrath will deal with the science dilemma in the series he has promised will follow on specific scientific and theological topics.

73. Stenmark.

74. Gregersen, p. 215. Gregersen’s discussion of seeking coherence at the different levels of data, theory, thought models, metaphors, and worldviews, is illuminating but unhelpful for my present purposes because he talks

of the need for critical incorporation of science at various levels without ever specifying what “critical” means.

75. Clayton, op. cit., p. 130.

76. Ibid., p. 133.

77. Clayton, *God and Contemporary Science*, p. 161.

78. Fraser Watts suggests one such possibility, namely, that one is entitled to reject a constraint if a particular scientific view in question is deemed to be an unwarranted extrapolation from the data; p. 177. In this case, however, the science in question is bad science, which obviously doesn’t deserve theological consideration. But this only begs the question of what counts as genuine science.

79. Clayton, op. cit., p. 8. His discussion of a “presumption of naturalism” (pp. 173ff) on the part of the believer appears to bias his approach toward the strategy of intelligibility and the theological program of Peacocke. In fact, in the preface (xi) he identifies the project of *God and Contemporary Science* as

a complement to Peacocke’s work in *Theology for a Scientific Age*.

80. Schrag, p. 53.

81. van Huyssteen, *Essays in Postfoundationalist Theology*, pp. 247ff.

82. Watts, p. 178.

83. Clayton, op. cit., p. 180.

84. Schrag, p. 60. Moreover, as Paul Feyerabend argues, criteria are typically not set up in advance of the concepts and theories upon which they are brought to bear: “they are often constituted by them and they must be introduced in this manner or else research will never get started” (from his *Farewell to Reason*, quoted in Schrag, pp. 60-61).

85. As van Huyssteen points out, the task of establishing criteria would be made even more difficult on a postmodern view of science as characterized by local practices which do not fit neatly into a unitary vision of science (*Essays in Postfoundationalist Theology*, p. 278). Such a view suggests that no single set of criteria would be adequate across the sciences.

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