

Symposium: Gregory Peterson's **Minding God**

WHAT DOES SILICON VALLEY HAVE TO DO
WITH JERUSALEM?

by Gregory R. Peterson

Abstract. Adapted from the introductory chapter of *Minding God: Theology and the Cognitive Sciences* (Peterson 2003), I here lay out a general approach for a dialogue between theology and cognitive science. Key to this task is an understanding of theology as the science or study of meaning and purpose. I give reasons why theology should be thought of in this sense and the potential fruitfulness of this approach.

Keywords: cognitive science; theological method; theology and science.

THE GAME OF THE CENTURY

It was, we were told, the game of the century. In the spring of 1996, Garry Kasparov, one of the greatest chess players in history, lost for the first time to a computer. Of course, the computer in question, named Deep Blue, was not just any machine. Built with the latest technology, Deep Blue could examine millions of chess positions per second, achieving through brute power what it lacked in elegance and finesse. Kasparov went on to win the match, but clearly the writing was on the wall and, indeed, he would lose the following year. The press milked the match for all that it was worth. Chess, that most rational of all games, had long been touted as the pinnacle of the human intellect, the symbol of the thinking mind over

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and against the thoughtless machine. Kasparov was playing not simply for the \$600,000 purse but for humankind. He was a modern-day John Henry, defending the dignity of our species.

Of course, the experts knew better. Deep Blue was, at best, an idiot savant. It could do only one thing: play chess. Critics pointed out that even that statement might be too much. After all, it could not see the chessboard, study its opponent, or move the pieces itself. It certainly could not stretch, read a good book, or order food at a restaurant. If anything, Deep Blue established what many already knew: that chess is not a very interesting indicator of what makes us human and that computers are very, very good at narrowly defined problems that are, relatively speaking, easy to calculate. Computers, unlike humans, do not have minds.

Many consoled themselves with just this observation. That Kasparov had lost to a glorified calculator should be neither surprising nor alarming. Comfort could be taken in the fact that the computer had not actually *thought* about its moves but worked largely by searching ahead over billions of possibilities. If a computer had to be able to examine millions of positions a second to beat a human being, the human mind must be pretty special indeed.

Ironically, these observations and responses, as accurate as many of them are, nevertheless testify to the fragility of the human ego and to the importance that we place on our mental abilities. Over the centuries, humankind often has claimed a special place in the scheme of things. We are, the argument goes, unique among all creatures upon Earth, and in a way that sets us above all. Wings make birds different, but they do not make birds special. It is our minds that make humans special. We can think, reason, and argue in ways not possible for any other creature on Earth. We can speak, reflect upon ourselves, and act morally. We laugh. We sin.

Enter the sciences. On one account, the story of science is the story of the ever-shrinking significance of humankind in the universe. First, Copernicus told us that Earth, and therefore humanity, was not at the center of the universe. Then Darwin told us that we were not specially created but an apparently unintended happenstance of natural selection. Computers like Deep Blue represent the culmination of humankind's dethronement. First we lose our place, then we lose our bodies, and finally we lose our minds. We are not, it turns out, deeply spiritual beings but merely sophisticated and somewhat clunky calculators. On this reading, not only are *we* not significant; nothing is. Life is simply a complex concatenation of atoms and molecules colliding in space. The end.

There is, however, another story that is more interesting and more persuasive. This story also includes the sciences, but its conclusion is radically different. Our significance is not lost but rather redefined. Reduction is complemented by emergence. We are more than clunky calculators; we are rich, social beings, more than the sum of our parts. In this story, the

cognitive sciences, the sciences of the mind, play a prominent role. Frequently, the physical sciences are seen to be the enemy of culture, reducing the rich to the bland and the mysterious to a chemical soup. While cognitive science frequently shares the methodological reduction of the physical sciences, it also reveals the interconnectedness and irreducible quality of the mind. As such, cognitive science also can be a tool for thinking about greater realities.

These greater realities, I argue, include theology. The link between cognitive science and theology may not immediately be obvious. Cognitive scientists talk about such things as neurons, visual perception, and brain modules; theologians talk about God, redemption, and social justice. Yet, while much of theology is God-talk, a great deal of it is concerned with broadly anthropological questions. Claims about human nature, human proclivities, and human potential are central to a theological understanding of the world. Cognitive science has much to say about all three. Religious literature traditionally and consistently has described God in personal, or at least personlike, terms. Indeed, at least a part of the theological tradition has seen the relationship of God and the world as being explicitly analogous to the relationship of mind and body. If our view of the latter changes, does the former as well?

Research in the cognitive sciences has revolutionized the way we think about mind, human nature, and our relationship to the world. Although this revolution sometimes has carried unfortunate philosophical baggage, it has dramatically improved our knowledge and understanding. Some of the findings and perspectives of cognitive science have the potential to revolutionize theology or at least subtly provide new insights and new perspectives into traditional areas of inquiry. To this end, cognitive science can provide a lens for doing theology. While a lens may seem to distort, its ultimate purpose is to clarify. Cognitive science can at times challenge traditional theological claims, but it also can provide models and metaphors for clarifying theological understandings of God, the world, and human nature. As a result, we gain a richer understanding of ourselves.

SILICON VALLEY

“Quid ergo Athenis et Hierosolymis?” “What,” Tertullian rhetorically asked, has Athens to do with Jerusalem?” (*On the Prescription of Heretics*, 7:19). Theologians from time to time since Tertullian have felt, as he did, that theology has little to learn and nothing to gain from dialogue with philosophy or, in the modern period, its science-minded offspring. Theology, it is said, is autonomous and relies solely on the revealed word of God. To subsume theology under a broader philosophical rubric is to reduce the significance and distinctiveness of the theological message. Likewise, to acknowledge the significance of the sciences for theological reflection is,

on some accounts, to misunderstand the domain and even the meaning of the terms *theology* and *science*. Theology deals with the spiritual realm, science with the material.

Such declarations, while noble in their intent, tend to be misguided and even disingenuous in their execution. Tertullian himself could not completely eschew philosophical categories and modes of thought. Karl Barth and other modern thinkers built their theological systems under the influence of such philosophers as Søren Kierkegaard and Martin Heidegger. Indeed, at the same time that these theologians distanced themselves from philosophical discourse, they inevitably used characterizations of theology, philosophy, and science that themselves required sophisticated philosophical analysis. The real question, it turns out, is not whether to engage philosophy but how.

Similar statements may be made about the natural sciences. It might even be said that the real question of the twentieth century was not whether and how theology should engage philosophy but whether and how theology should engage the natural sciences. Many of the dynamics of twentieth-century theology and religion can be seen precisely as a response to the encroachment and shaping influences of the sciences. Neoorthodox and existentialist theologies could establish the separateness of theology only by largely confining its subject matter to the human subject, which alone seemed impervious to scientific investigation. Religious conservatives and fundamentalists, at least in the United States, frequently have taken a different approach, acknowledging the significance of the sciences but engaging in head-on conflict. Process theologians and those engaged in the ongoing and growing religion-and-science dialogue have prominently opposed this trend, arguing that theology and science can and should avoid conflict and embrace dialogue or even outright synthesis under a broader metaphysical rubric (see Barbour 1997, chap. 4).

If Tertullian were alive today, he might contrast Jerusalem not with Athens but with, say, Los Alamos or Fermilab. If we were to speak of the cognitive sciences, however, we would have to pick another locale. In the early twenty-first century, many might rephrase Tertullian's question: What does Silicon Valley have to do with Jerusalem?

Why Silicon Valley? As home to the computer and software industry in the United States, Silicon Valley has little to do directly with cognitive science. Although Silicon Valley programmers freely use expert systems originally designed by researchers in artificial (computer) intelligence interested in modeling the human brain, their interests tend to be completely commercial in character with little concern for the broader research and philosophical questions posed by artificial intelligence specifically or cognitive science generally.

Yet, there is a certain appropriateness as well. The desktop computer has become in the past half century the primary metaphor for understand-

ing the human mind, however inadequate we now realize that metaphor to be. To speak of the brain as being “hard-wired” and to speak of mental activities in analogy to software is commonplace. Conversely, computer scientists often have co-opted the language of biology, speaking of the computer chip as the “brains” of the computer. Computers catch “viruses,” which can be transmitted from other computers like germs. More than this, however, Silicon Valley also reminds us of the continual advance of computer technology, an advance that, according to some advocates, will eventually surpass that of the human mind and produce an understanding of cognition heretofore unthinkable. The giant mainframe computers of the 1950s and 1960s are now dwarfed in computing power by personal digital assistants that fit in the palm of one’s hand. Moore’s law, which predicts that computing power will double every eighteen months, has become a staple of the industry. In this sense, Silicon Valley represents the modern incarnation of scientific progress, an incarnation that threatens to eventually overtake the human subject itself.

This image of Silicon Valley and the computer industry is even promoted as utopian. Futurists such as Ray Kurzweil (1999) and Hans Moravec (1990) foresee a future when human beings as biological organisms are replaced by artificial life forms, enabling our very consciousness to be “downloaded” onto a vast computer network that will allow us to achieve a kind of immortality. Implicit in this image is the claim that such technological advances will lead to a complete understanding of the human mind and spirit. It is a short step from here to the claim that human beings are “nothing but” sophisticated computers and that human nature can properly be understood only within a naturalistic, technological context. Consequently, there appears to be little room left for religion. Silicon Valley indeed seems to have little to do with Jerusalem.

The metaphor of Silicon Valley may be the most familiar of the public faces that have some relation to cognitive science, but it is not the only one and certainly not the best. In many ways, modern cognitive science roots itself in the grand philosophical tradition from Plato to Descartes. Cognitive science, at its most basic, is the science of *thinking*. The study of language, reasoning ability, memory, and perception—all topics traditionally associated with the notion of thinking—have been key areas of investigation for cognitive science, and many of its early successes and influential theories dealt with these subjects. More recently, the notion of what counts as thinking has changed significantly, as the role of the emotions, the body, and the environment have increasingly come under the scrutiny of the cognitive sciences as well. Silicon Valley is a mere cipher for what cognitive science engages. Thinking, we are often led to believe, is what Deep Blue and desktop computers do. Presumably we pale in comparison. Yet, the cognitive sciences in many ways show us something significantly different, something stranger and more beautiful at the same time.

The image of Silicon Valley, in its emphasis on computers, also fails to convey the breadth and interdisciplinary character of cognitive science. One may say, in fact, that cognitive science represents not a single discipline as much as an array of disciplines united by a common perspective and research agenda. One may speak metaphorically of the vertical and horizontal interdisciplinarity of the cognitive sciences. Vertically, modern cognitive science includes such fields as neuroscience, cognitive psychology, linguistics, and anthropology, each analyzing a different layer (so to speak) of the human person. Horizontally, cognitive science is not devoted to the human subject alone but includes the study of artificial (as in computers and robots), animal, and (speculatively) extraterrestrial intelligences as well. In fact, one of the strongest implications of the interdisciplinary character of cognitive science is that, whatever we may prefer to believe, it is clear that we are not alone in the universe when it comes to activities of the mind. Without a doubt, we are different, but in a way that connects us with other organisms and with the rest of the physical world.

So no one "Athens," no one place or image, adequately serves as a symbol for all that cognitive science now encompasses. Yet, many places embody certain aspects and ideals, including the Artificial Intelligence lab at MIT, the Yerkes Primatology lab in Atlanta, and the Center for Brain and Cognition in San Diego. Collectively, they form a sort of Athens that is shaping the way that we think about ourselves and our place in the world. Like physics, chemistry, and biology, the cognitive sciences are not some passing trend but are here to stay. It is appropriate to ask what the significance of this new Athens is.

JERUSALEM

There are many today who are content to repeat Tertullian's dictum or at least to modify it. It may be conceded that theology and philosophy are inevitably intertwined, but often a line is drawn at the sciences. There is a certain intuitiveness to this move. After all, theology is focused on the study of God; the sciences not only do not speak of God but seem to purposefully exclude all God-talk or appeal to divine activity. Like oil and water, theology and science simply do not mix.

Serious study, however, quickly reveals that while we may reasonably conclude that theology is an autonomous discipline, with its own norms and subject matter, absolute separation of theology and science typically relies on a conception of theology that is severely restricted in its claims and scope. Ultimately, theology makes claims about the world if for no other reason than it is primarily about God's relationship to the world that theology traditionally has been concerned. Doing theology inevitably entails some kind of encounter with the sciences, even if only at the minimal level of radically relativizing either theological or scientific claims in order to make coexistence possible.

As we shall see, the encounter of theology and science is particularly unavoidable in the case of the cognitive sciences. True, cognitive science does not study God. Or, to put it bluntly, God is not the kind of intelligence that cognitive science investigates. The reverse is not true: although cognitive science is not interested in theology, theology is tremendously interested in issues pertaining to human nature, a subject about which the cognitive sciences have much to say. Officially, theology is concerned with the nature and action of God. In practice, much of theology is anthropological in character and dedicated to providing an understanding of the human person and the human situation. Theology speaks of God because, in no small part, God is important to human beings. According to Christian tradition, we are made in the image of God yet suffer from a fallen state that involves separation from God. This sense of alienation is overcome only by the sacrifice of Christ, who offers a transformed life and reveals a future hope. God is important precisely because belief in God profoundly affects how we think of ourselves.

Historically, theological anthropologies have two broad concerns. First, they often are metaphysical in character, providing an explanation of human nature, its ultimate origins, current propensities, and ultimate fate. As a consequence, theology traditionally has attempted to explain what is meant by the image of God, in what ways we are (or are not) free, and what we mean by such terms as *soul* and *spirit*. Theology also explains our place in the world, often through the doctrine of the image of God, as well as our expected purpose and behavior. Second, and perhaps more important, theology is soteriological in character. Theology develops concepts such as sin, conversion, and sanctification because they provide the framework within which human purpose and happiness are understood. Inevitably, soteriology and metaphysics are connected. Metaphysics helps us to understand our current predicament; soteriology informs us how to transform it.

Cognitive science affects both metaphysical and soteriological accounts of human nature. Metaphysically, cognitive science profoundly affects how we think of issues of human origins, mind and body, the unity of the human person, and the potential for human freedom. Soteriologically, cognitive science influences how we think of mental health and thus human well-being, our relationship to other organisms, and the nature of human cooperation. Certainly this "soteriological streak" is present among popularizers of psychology and specific branches of cognitive science. One can view with some legitimacy the development of the popular-psychology and self-help market as, in some ways, a competing secular soteriology whose intent is to at least tacitly replace the religious soteriologies that many find no longer satisfying. One need only consider the success of such books as Daniel Goleman's *Emotional Intelligence* and Howard Gardner's several books and spinoffs on multiple intelligences to see the

influence of cognitive science on the popular-psychology market (Goleman 1997; Gardner 1993). This soteriological character is even more evident in the futurist writings of Moravec and Kurzweil, both of whom envision a kind of future technological paradise brought about by the union of human intelligence and computer/robot technology.

The theologian may look upon this soteriological streak as illegitimate, as an unacknowledged sleight of hand that moves from science to religion. Such works suffer from the mistake of scientism, conflating scientific findings with religious and philosophical claims and generalizations. While these observations are pertinent, they risk missing the larger point, which is that, although the metaphysics and soteriology we are speaking of are separate and distinct from the cognitive sciences, they should not be addressed in isolation from the cognitive sciences, precisely because the findings of cognitive sciences have the potential to significantly affect how we think about these issues. Any claim of human uniqueness needs to take into account at some level the now extensive research on animal (especially primate) intelligence and social behavior. Any soteriology that makes claims about human transformation needs to take stock of the increasingly integrated account of mind, brain, and body that the cognitive sciences reveal as well as the increasingly close ties being discovered between cognition, emotion, and concepts of mental health. Such findings may not determine which metaphysical or soteriological move to make, but they can strongly influence and even limit the discussion.

One of the traditional strategies for declaring the independence of science and religion, and therefore the independence of science *for* religion, becomes particularly problematic when the cognitive sciences are taken into account. On these accounts, true religion deals with and arises out of human subjectivity. How this occurs has been expounded in various ways. Immanuel Kant can be credited with beginning this shift with his account of the transcendental subject and, through it, to moral discourse. Shortly thereafter, Friedrich Schleiermacher famously tied religion to a particular kind of experience, the feeling of absolute dependence. While Schleiermacher had multiple motivations for moving in this direction, one of the desired effects was to provide an account of religion that was compatible with the Newtonian science of the day. Because that science could say nothing significant about human subjectivity and, indeed, seemed unlikely to, the identification of human subjectivity with the source of religion had, for this and other reasons, great appeal and success. This success is evident in such diverse thinkers as Kierkegaard, Rudolf Otto, and Mircea Eliade. It has been no less influential among modern theologians. Although Barth distanced himself from the tradition of liberal theology inaugurated by Schleiermacher, he nevertheless retained the liberals' emphasis on the subject. The existentialist theologies of such thinkers as Rudolf Bultmann also emphasize the primacy of the subject, relativizing the claims

of religion in a way that makes no claims about the physical world while at the same time identifying religion with a concept of the human subject as distant from and even untouchable by the physical sciences.

Theologians may claim, after all is said and done, that a theological analysis of the human subject has something unique and distinct to contribute, but it is increasingly clear that such claims can no longer be made as if the sciences have nothing to contribute. A completely transcendent subject no longer seems conceivable, because much of what it does clearly arises out of and is made possible by the processes of the brain. We may reason about morality as cogently as Kant did and feel as deeply as Schleiermacher, but it is clearly our biology that makes this possible.

What is needed, therefore, is not a kind of theological isolationism but rather interdisciplinary engagement. This kind of engagement has proceeded for some time with physics and biology, as can be seen in the works of John Polkinghorne (1996) and Arthur Peacocke (1993). Individuals such as Donald MacKay and James Ashbrook provided early models of dialogue and engagement between religion and neuroscience, but only within the past decade has a serious body of literature been built up. There is a great deal of work yet to do, and the full implications of the cognitive sciences for theology have yet to be fully addressed.

JERUSALEM ENGAGING ATHENS

In what follows I make two arguments, one explicit and one implicit. Explicitly, I argue that serious consideration of the cognitive sciences stands to affect nearly every facet of Christian theological thinking. In doing so, I primarily engage the classic themes and doctrines that have defined the Catholic and Protestant traditions of Western Christian thought. Consequently, issues of human nature, the nature of God, and the relation of humankind to the world are major subjects of exploration. Implicitly, it should also become clear that cognitive science has implications not simply for conventional, denominationally orthodox modes of theology but for all modes of theological thinking. In the late twentieth and early twenty-first centuries, theology as a discipline has been characterized more than anything else by radical methodological pluralism. Some methodologies, such as process thought, have inclined toward dialogue with the sciences; others, such as some versions of postmodern, pragmatist, and deconstructionist theology, have either rejected dialogue altogether or approached the sciences as one "social text" among others, with no special authority or importance. The current work cannot fully engage this diversity, but I contend that all forms of theology stand to be influenced by serious dialogue with the cognitive sciences. That is, inasmuch as methodology and content are connected, the content of the cognitive sciences can affect to some extent how we go about *doing* theology.

Moreover, a theology that engages the cognitive sciences must be aware of two other contexts. First, the engagement takes place in the context of a larger science-and-theology/science-and-religion dialogue. One could argue that there has never been a period when science and theology have not been in dialogue. The reflections of such significant figures as Augustine and Aquinas were as much influenced by the "science" of their day as the natural theologies of the eighteenth century and the empirical and process theologies of the twentieth. In recent decades, this science-and-theology dialogue has taken on a quite definite shape, spurred most significantly by the work of Ian Barbour but also influenced and shaped by other scholars in the United States and Europe (see Barbour 1997). The result is that science-and-religion now represents a rather distinct subfield, characterized increasingly by a number of its own specializations. Any current work on science and theology must now be interpreted in relation to this broader dialogue.

At the same time, any dialogue between theology and cognitive science should be cognizant of not only theological pluralism but also religious pluralism. It is increasingly the case that Christians are not the only ones taking the claims of the sciences (including the cognitive sciences) seriously. There is potential for a rich "trialogue" between religious traditions on the matters of science as each works through issues of borders, compatibility, and interpretation. Awareness of this pluralism should make us wary of any attempt to swiftly "baptize" science with the imprimatur of one's own tradition.

Acknowledging these two contexts, one relatively narrow and the other quite broad, is one way of situating the kind of theology and theological dialogue that is most appropriate. For practical purposes, I assume a rather broad understanding of the nature and task of theology while at the same time engaging in sometimes quite specific doctrines and issues, such as original sin and the personhood of God. The specificity serves a dual purpose, showing not only how the cognitive sciences require us to rethink particular doctrines but also how thinking theologically about the cognitive sciences should proceed. Arguments about such doctrines as the image of God, therefore, are both substantive and illustrative, pointing to the possibilities for yet further kinds of discussion in different arenas. My goal is to engage the widest audience possible while at the same time acknowledging the plurality that is necessarily present.

Broadly conceived, then, I take theology to be that field of inquiry whose primary purpose is to discern the meaning and purpose of life. Theology, more than any other discipline, is concerned with the task of providing orientation and direction for the individual. It attempts to answer those questions asked on clear, starry nights and in the deepest, darkest moments. Who am I? Why am I here? What is my purpose? How should I act? How can I be fulfilled? Historically, these all have been theological

questions, and it has been primarily the task of theologians and religious traditions to answer them. Certainly, such questions require some philosophical acumen as well, but as philosophy has attempted to answer them, it has become increasingly religious in character. This can be seen clearly in the philosophies of the Hellenistic and Roman periods, such as Neoplatonism and Stoicism. The work and followers of Karl Marx and Friedrich Nietzsche provide modern counterparts. The adoption of the term *theology* by Buddhists and Hindus indicates the extent to which this broad understanding of theology now exists, even though to speak of Buddhist theology in a literal sense can be a contradiction in terms.

What historically has given theology much of its character is its effort to answer such questions in terms of a worldview. Any attempt to provide such an orienting worldview is, in effect, a theology. The reason that naturalist philosophies of various stripes often have so many negative things to say about religion is precisely because of their (one might say ironically) theological character. In the “evolution wars” that take place especially in the United States, the importance of natural selection for both naturalists and theists in the debate has, arguably, little to do with the scientific merits of the theory and much to do with the implications the theory is said to have for the important theological questions of meaning and purpose. The argument is partially about science, but it is very much about theology.

Christian theology, then, represents only one mode of doing theology. Like most theologies, Christian theology provides a worldview that orients believers in their interior lives and outward behavior. For Christians, this worldview has spoken preeminently of the ultimate role and nature of God, whose actions create, redeem, and sustain the world. Such a worldview is quite specific in many of its claims and, consequently, quite successful in its attempts to orient believers and answer the basic questions of meaning and purpose. At the same time, Christian theology traditionally has relied on concepts and claims that are not accessible by empirical observation but only through revelation. The category of faith has played an important role historically and still does. To borrow a phrase from the philosophy of science, human experience underdetermines the Christian (and, one may say with little hesitation, nearly any) worldview. As with every theological tradition, Christian theology is a complex mix of considered reasons, deeply held convictions, and (occasionally) best guesses.

Ideally, however, theology is a rational enterprise that finds its place among (some would still say above) other academic disciplines. As such, any given theology needs to justify its claims in the relevant public spheres. To the extent that theology relies on the categories of revelation and faith, however, theology is not truly public but, at least traditionally, relies on some authority (the church, the creeds, the Bible) whose veracity and utility rely more on the category of faith than of reason. As a result, one primary task of theologians has been to explicate how and in what ways

theology and theological claims are rationally defensible. As with any area of inquiry, they must answer the basic question, "Why would anyone believe *that*?"

For theology, a first task is an elucidation of exactly what *that* is. *God*, *the soul*, and *salvation* are all multivalent terms that historically have taken on a range of meanings. God may be taken to be Aristotle's unmoved mover or Hegel's world-spirit. The soul has been variously defined as the form of the body (Aquinas, following Aristotle) or as a separate, distinct, nonextended thinking thing (Descartes). In the modern period, such questions of definition and ontology, particularly as applied to God, have become strikingly important and widely divergent. God is variously conceived to be a special kind of actual entity (process theology), the ground of being (Paul Tillich), or the mysterious and serendipitous creativity of the universe (Kaufman 1993). Alternatively, the multivalence of theological terms may be retained in a way that opts not for a literal or quasi-literal explication but instead for the language of symbol and metaphor. Thus, at the same time that Tillich speaks of God as the ground of being, he acknowledges the symbolic character of religious language that militates against overly literalistic accounts of God that presume more than we know.

This symbolic character of theological discourse has been a partial consequence of the historically holistic nature of theological reflection. Unlike other rational enterprises, theology as a discipline has been inclined to draw from the philosophically messy realms of personal experience, literary analysis, and artistic insight. For most of the sciences, words are descriptive, used to provide as transparent an account of the relevant phenomena as possible. For many forms of theology, however, words are also disclosive, harboring the potential to elicit new experiences and insights on the part of the reader.

As a result, most theologies can be seen to lie along what might be called a poetic-scientific continuum. Theologies that tend toward the poetic eschew the categories of literal, scientific rationality in favor of modes of writing and expression that seek to open up new vistas, not test new theories. Such theologies are not unique to Christian thought; they may be found in Jewish, Muslim, and Buddhist contexts as well. Scientific theologies seek to do precisely the opposite. In this approach, *God* denotes a particular kind of being or reality in relation to ourselves and to the world, and the purpose of theology is to elucidate a system or theory that is explanatory in character. While poetic theologies tend toward the symbolic and metaphorical, scientific theologies tend toward the literal. Definitions, propositional claims, and rational argumentation often play an important role in scientific theologies.

In speaking of scientific theology, I am of course using the term *scientific* in its broadest sense to denote any mode of rational inquiry. Rational categories are used either to demonstrate the veracity of specific Christian

doctrines or to limit the claims of a universal, rational discourse, thereby making room for the category of faith. Aquinas used philosophical categories to demonstrate the existence of God. Kierkegaard used Hegel's dialectical reason to demonstrate its own limitations in the face of genuine religious commitment. Both rational strategies are commonly used, sometimes by the same thinkers. Theologies that engage a lived faith, however, must consistently attempt (one might say risk) the former, positive approach. For theology to be relevant, it must make claims about the world. To make such claims, it must inevitably engage rational modes of thought.

The notion of a scientific theology has been put forward several times over the past century, albeit with quite different ideas about what *scientific* meant. Neoorthodox theologians have used the term, as have those in mid-century empirical theology (e.g., Torrance 1969; Burhoe 1981). More recently, some theologians have embraced the philosophy of science as a means for providing a theological method. In this approach, theology is scientific to the extent that it shares the same method of intellectual inquiry with other, well-established sciences. Wolfhart Pannenberg (1976), for instance, justifies speaking of theology as the science of God by appeal to theology's ability to follow the scientific method as described by Karl Popper and others. Nancey Murphy (1990) goes much further, claiming that while theology may not currently be scientific in character, it can and should be. Building on the thought of philosopher of science Imre Lakatos, she sees theology in terms of competing research programs, consisting of core claims that are elucidated and evaluated in terms of their empirical confirmation and comparison to the success of other research programs.

The cognitive sciences may be relevant to the whole spectrum of theological thinking, but it is this latter, more scientifically oriented, form of theology that I most wish to engage, partly because this form of theology is most impacted by the kinds of claims coming out of the cognitive sciences. Scientifically oriented theologies make the most specific claims and, consequently, have the most at stake in the areas where science and theology meet. But this form of theology is most engaged as well, because, in my estimation, it has a significant impact on how we think and act. A theology that takes a stand, for instance, on human uniqueness takes a stand as well on how we interact with all the other subjects and objects in the world. In the end, such theologies often claim too much, which is one reason why history is replete with bygone theological systems. Even from failures, however, there is something to be learned, and it is only through the processes of construction and engagement that true theological wisdom can develop.

NOTES

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1. For the early work, see MacKay 1980 and Ashbrook 1984. For more recent work, see Ashbrook and Albright 1997; Brown, Murphy, and Maloney 1998; Watts 2002.

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