

# PERSPECTIVES on Science and Christian Faith

JOURNAL OF THE AMERICAN SCIENTIFIC AFFILIATION

*In this issue ...*

Chance for a Purpose

Revisiting the God of the Gaps

Nonexistence of Humphreys' "Volume Cooling" for Terrestrial Heat Disposal by Cosmic Expansion

Athens Meets Jerusalem: Revelation for Philosophers

God and Evolution: A Review of Four Contemporary Books

*"The fear of the Lord  
is the beginning of Wisdom."*

Psalm 111:10

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1. Submit all manuscripts to: **Arie Leegwater, Editor, Calvin College, De Vries Hall, 1726 Knollcrest Circle SE, Grand Rapids, MI 49546-4403. E-mail: leeg@calvin.edu.** Submissions are typically acknowledged within 10 days of their receipt.
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3. Use endnotes for all references. Each note must have a unique number. Follow *The Chicago Manual of Style* (14th ed., sections 15.1 to 15.426).
4. While figures and diagrams may be embedded within the Word text file of the manuscript, authors are required to also send them as individual electronic files (JPEG or TIFF format). Figure captions should be provided as a list at the end of the manuscript text. Authors are encouraged also to submit a sample of graphic art that can be used to illustrate their manuscript.

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Arie Leegwater

# The Two-Book Metaphor: What Questions Do We Need to Ask?

Recently I came across a collection of edited lectures given by Olaf Pedersen entitled *The Two Books: Historical Notes on Some Interactions between Natural Science and Theology* (Vatican City: Vatican Observatory Foundation, 2007). Reading the book reminded me once again how historically formative the two-book metaphor has been in framing our questions and indwelling our Western consciousness concerning the relation of science and religion.

For many interpreters, the relation of science and religion translated into the question of the relation of science, a study of the book of nature, and theology, a study of the book of sacred Scriptures (and, for some, a study of God). In short, the perceived relationship (and question posed) is the relation of science and theology conceived frequently as a relationship between two unitary entities, even disciplines. I was asked this very question when considering the editorship of *PSCF*. As I recall, I hesitated a moment before I replied. It is, indeed, a very common question, but one which, as Pedersen brilliantly shows, carries a great deal of historical freight. Let me attempt to explain why I hesitated.

“In our questions  
lie our principles of analysis,  
and our answers  
may express whatever  
those principles  
are able to yield.”

These words by Susanne Langer, written many years ago in her landmark book

*Philosophy in a New Key* (1941), still ring true today. What questions should we and may we ask concerning the study of these two books? First, what are these entities called “science” and “theology”? Does “science” refer to the theoretical results obtained? To the plethora of practices one needs to competently perform in order to collect data and detect patterns of interaction? Or does “science” refer to the whole culture-imbedded processes of theory formation and experimentation? What of “theology”? Are we referring to systematic theology? Biblical theology? A natural theology?

Also of importance to our present-day situation is the question: is it helpful to conflate religion and theology, as is frequently done? What then do we make of religions that do not profess to have a god? Consider the recent book *Practical Mystic: Religion, Science, and A. S. Eddington* (Chicago: University of Chicago Press, 2007) by Matthew Stanley. In it he shows that if we were to employ the usual propositional categories of theology, we would see few connections between Eddington’s theology and science. But with respect to Eddington’s religion and his astrophysics, things are much different.

I think we tend to over-intellectualize the relationship of science and religion. Somehow, the tenor of the question posed leads us to compare propositional statements (truths), that is, those stating scientific results and those statements (truths) formulated by the latest ortho-

*We must take seriously the fact that the relation of science and religion is not simply of theoretical concern. It is a matter of life and death, and it must bear fruit in our lives ... the truth in which we stand and move and have our being is to be lived and not simply claimed.*

# Editorial

## *The Two-Book Metaphor: What Questions Do We Need to Ask?*

dox systematic theology. After making the comparison, and developing harmonizing strategies if they disagree, we often think the question of the relationship of the two books is adequately answered.

Second, the metaphor of the two books, two books of revelation, invites other questions. For example, what is the relationship of these two books? Do we have two books that are independent of each other, with the one book revealing to us that God created, and the other book telling us how he did it? Is it that straightforward? Do the books parallel or complement each other? Do they stand in a hierarchical relationship? One could go on.

Note, too, books are meant to be read, in short, interpreted by readers. Any interpretation entangles us in hermeneutical concerns. That invariably makes things more complex than we usually admit. One missing element has been highlighted by recent work in the philosophy and history of science. The practical turn in the philosophy of science is evidenced by a multitude of historical case studies in which the general trait is the insistence on the local character and heterogeneity of scientific practices, and correlatively, on the contingency of stabilized results. Those case studies help to articulate the cultural situatedness of scientific practice, putting science in its place. I maintain that we can learn from these studies and should not write them off simply as postmodern pabulum.

For too long the relation of science and religion, considered as one between science and theology, has been seen solely as an intellectual comparative exercise. We have often isolated theology and science from their deeper cultural contexts. We are satisfied to compare the “objective truths of science” with the “objective truths of Scripture.” But we must take seriously the fact that the relation of science and religion is not simply of theoretical concern. It is a matter of life and death, and it must bear fruit in our lives. Do our scientific and technological activities enhance human flourishing, promote justice, and provide creational care? Few answers are final; few explanations are complete. However, the truth in which we stand and move and have our being is to be lived and not simply claimed. ☞

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## In This Issue

Following up on the December 2008 issue of *PSCF*, we begin this first 2009 issue with a discussion of the character of chance, “Chance for a Purpose,” in an article written by John Hall. Next, Ronald Larson revisits “God of the Gap” and design arguments, and elaborates whether such arguments provide a threat or an opportunity for apologetics. In the third article, J. Brian Pitts takes a close look at the validity of young-earth RATE project arguments which call for accelerated nuclear decay processes generating prodigious amounts of heat, heat which needs to be dissipated extremely rapidly.

The issue includes two essay book reviews. Robert Prevost examines how revelation as a category may affect not just theology, but philosophy as well. Bethany Sollereder evaluates four recent books under the rubric of “God and Evolution.”

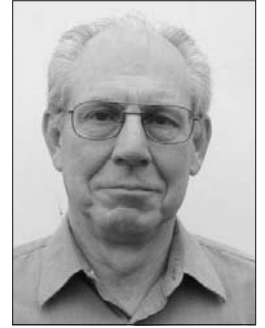
I trust you will also enjoy reading the fifteen book reviews and one book notice authored by a diversity of reviewers. The issue closes with three letters (two of which are an exchange) written in response to articles previously published in *PSCF*.

Again, let me remind you that the quality of the journal is a reflection of the evaluative work done by our band of trusty referees. Please keep your manuscripts coming. We could certainly use more exemplars of your wisdom and insight! ☞



NASA/CXC/Penn State/E. Feigelson et al. Optical: NASA/STScI





John W. Hall

# Chance for a Purpose

John W. Hall

*In our popular understanding, chance implies a lack of purpose. Consequently, the presence of chance or stochasticity in some physical and biological processes has led to the inference that the universe has no purpose. But we ourselves construct systems with stochastic features for our own uses. Several such systems were investigated to elucidate how the set of possible outcomes of a stochastic process is related to the global and local purposes of the system. One observation is that when every possible outcome is compatible with a particular purpose, the outcomes may be described as “purpose-equivalent.” This and other insights are used in investigating the relationship of two created systems with what we know of God’s purposes. These are the physical processes that produced the distribution of matter in the universe and biological evolution. How stochastic processes relate to other forms of divine action is also discussed.*

The title of this article “Chance for a Purpose” seems contradictory. Was it not by chance, that is, without it being his intention or purpose, that the Amalekite encountered King Saul on Mount Gilboa with such disastrous consequences?<sup>1</sup> Such an account reflects our popular understanding. Chance implies a lack of purpose. Consequently, the use of chance to describe some physical and biological processes has been interpreted as implying a lack of purpose in the universe as a whole. Yet we ourselves construct systems incorporating chance processes and put them to our own uses.

In this article, several such systems will be examined to see how their processes relate to their purposes. With these insights we can proceed to examine chance processes in physical and biological systems and consider how they may relate to God’s purposes and actions. But first, the concept of chance needs to be scrutinized further.

## Chance and Stochasticity

In his investigation of chance in God’s world, philosopher Peter van Inwagen described chance this way:

What I shall mean by saying that an event is a “chance” occurrence, or a state of affairs a “matter of chance” or “due to chance” is this: The event or state of affairs is without purpose or significance; it is not part of anyone’s plan; it serves no one’s end; and it might very well not have been.<sup>2</sup>

Here van Inwagen identifies chance with a lack of purpose. Chance events, though they occur, are not part of God’s plan.

Non-Christians draw even stronger conclusions. Perhaps this was expressed with the greatest clarity by the late Nobel prize-winning biologist Jacques Monod. His book *Chance and Necessity*, which describes his understanding of the interplay between these two features in modern biology, famously concludes:

*We [will] examine chance processes in physical and biological systems and consider how they may relate to God’s purposes and actions.*

**John Hall** earned his B.Sc. in honors physics from the University of Toronto and his Ph.D. in mathematical statistics from Virginia Tech. Now retired, he spent his career applying statistical methods in research in the health and agricultural fields. As well as being interested in the history and philosophy of science, he now actively researches in genealogy. This has resulted in a book on the history of his Halls and another on a related family, the Breakeys. A resident of Victoria, British Columbia, he enjoys afternoon rambles along the coast with occasional sightings of seals, otters, and eagles. He also enjoys snow as long as it stays on the distant mountains he can see from his windows.

# Article

## *Chance for a Purpose*

The ancient covenant is in pieces; man knows at last that he is alone in the universe's unfeeling immensity, out of which he emerged only by chance. His destiny is nowhere spelled out, nor is his duty. The kingdom above or the darkness below; it is for him to choose.<sup>3</sup>

For Monod, then, the presence of chance means that there is no God. Humans are alone. But this conclusion, darkly as he paints it, leads him not to despair but to anthropocentrism in its modern form. Humanity, in this view, is free to choose its own destiny.

Despite challenges, Monod's view has persisted.<sup>4</sup> Philosopher Daniel C. Dennett's rhetoric leaves no uncertainty when he calls natural selection a "mindless, purposeless, mechanical process" and a "universal acid" and refers as well to "the mere purposeless, mindless, pointless regularity of physics."<sup>5</sup> Dennett's universal acid includes chance variation. The possibility that this variation may sometimes be the result of quantum effects satisfies philosophers like David N. Stamos and Alex Rosenberg, that no reconciliation with design, and hence with purpose, is possible.<sup>6</sup> Referring to Dennett's "universal acid" as the "solvent algorithm," Sommers and Rosenberg write: "The solvent algorithm deprives nature of purpose, on the global and local scale."<sup>7</sup>

So pervasive is the association of purposelessness with chance that I propose to abandon the term and use "stochastic" to describe what we are considering instead. A stochastic process is one for which there is more than one possible outcome and the outcome that actually occurs cannot be predicted with certainty. For many such processes, the set of possible outcomes is associated with a probability distribution. The question of whether a stochastic process, or the system of which it is a part, has any purpose cannot be prejudged. The answer must be determined by studying the system itself and any purposes claimed for it.

A familiar example of a stochastic process is radioactive decay. The rate at which a sample of a radioactive isotope decays is equal to the amount of the isotope present multiplied by a constant that is a characteristic of the isotope. For samples containing large numbers of atoms of the isotope, the average amount remaining over time is described by an exponential function. But the process is stochastic because the time at which any particular atom decays is unpredictable, as is the number of

atoms that will decay in a given time interval. For time intervals in which only a small amount of a sample decays, the number of atoms decaying is described by the Poisson probability distribution.<sup>8</sup>

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Radioactive decay is a quantum process and consequently seems essentially stochastic. That is, no one has discovered any underlying mechanism that produces the phenomenon. What is more, entanglement experiments have shown that the presence of hidden variables is incompatible with the assumption of locality, that measurements on a system localized in space-time cannot be instantaneously influenced by a distant event. The implications of these experiments are far-reaching and continue to be actively investigated.<sup>9</sup>

Other processes can generate stochastic outcomes. Over the past several decades, there has been much interest in chaotic processes. These processes produce outcomes that are neither essentially stochastic nor easily predictable.<sup>10</sup> One notable feature of a chaotic process is its sensitivity to initial conditions. Small changes in initial conditions lead over time to widely divergent outcomes.

Mathematical models of chaotic processes are deterministic rather than stochastic. Given the same initial conditions, a chaotic process operating in isolation produces the same results. Moreover, examination of the phase diagram for such a process can reveal nonstochastic patterns called strange attractors. For some chaotic processes, however, these patterns can be hard to identify, and real processes do not operate in isolation.

The lack of isolation can have dramatic consequences for dynamic systems. On average, each molecule in the air experiences fifty collisions in less

than a microsecond. But the accurate prediction of the trajectory of an air molecule after fifty successive collisions must take into account the gravitational effects of the electrons at the edge of the observable universe.<sup>11</sup> Because of this universal dependence, the complete set of initial conditions will never reoccur.

The phenomena that we will consider are produced by multiple processes interacting with each other under conditions that are not tightly controlled. Consequently the initial conditions will not be specified precisely and will become irrelevant as the processes repeatedly interact. Under these conditions, the outcomes are effectively stochastic.

With these ideas in mind, we are ready to consider the nature of purpose in three humanly constructed systems with stochastic features: ice hockey, lotteries, and certain experimental designs used in scientific research.<sup>12</sup>

## Constructed Systems with Stochastic Features

### Ice Hockey

The game of hockey is played by two teams skating on a sheet of ice with a goal net at each end. Six players of each team may be on the ice at a time and the objective of the game is to shoot a hard rubber puck into the opposing team's goal. The goal is guarded by a player called the goalie and the puck is controlled using hockey (hooked) sticks. Professional matches are played over three twenty-minute periods. At the end of the match, the team that has scored the most goals wins, with ties being possible. In professional games, scores are rarely above single digits.

Two factors govern which team will win a particular match. First is the relative strength and skill of the two teams, the better team being more likely to win. Second is a stochastic element. This includes the bounce of the puck, the roughness of the ice, the position and speed of the stick when a shot is made on the goal, and the positions of all the players, especially the goalie, at the time of the shot. In the professional National Hockey League (NHL), the stochastic component of the scores is well described by the Poisson distribution, the same one that describes radioactive counts.<sup>13</sup>

The NHL, in a single season, forms a system whose purposes can be investigated. To simplify the discussion, consider an earlier era when the league had only six teams. Each team played seventy regular-season games, playing every other team fourteen times. At the end of the season, the results showed that there were differences among the teams. Attempts were made to increase the effect of the stochastic element by trading players among teams to even up their relative strengths. What made the sport exciting for fans was that "on any given night any given team can beat any other team."<sup>14</sup> This possibility ensured the interest of the fans, producing good attendance at the games and putting a profit in the team owners' pockets. A primary purpose of the NHL, a "global" purpose of the system, was to make a profit for the owners. Ensuring that the outcome of a match had a large stochastic component was not purposeless but contributed to this global purpose.

However, this is not the whole story. In a single match, each team wants to win and, ultimately, to advance to the playoffs to earn financial bonuses. At best, only one of the two teams achieves this "local" purpose. Thus, while it contributes to the global purpose, the stochastic nature of the game either frustrates or serves the more restricted, local purpose of an individual team. Because they serve global purposes, all possible outcomes of a match may be said to be "purpose-equivalent." But only a subset of outcomes, those leading to a win, serve the local purpose of an individual team.

In order to identify other features of such systems, it will be useful to have another example in mind. A lottery provides such an example, but in examining lotteries, I will set aside any ethical issues concerning them.

### Lotteries

In the 6/49 lottery that is run in my province, the set of possible outcomes is made up of all the combinations of six different numbers between one and forty-nine. The grand prize is divided among the holders of tickets whose six numbers match the winning combination. A seventh number, "the bonus," along with partial matches to the winning combination, are used to award subsidiary prizes. These will be ignored for the sake of simplicity. The profits from the lottery go to the provincial governments that own it.

# Article

## *Chance for a Purpose*

Each time the lottery is played, the winning combination is determined by a mechanical device consisting of a rotating sphere containing forty-nine balls, each ingrained with a single number. Arms within the sphere and rotating in the opposite direction to it agitate the balls, and after a period of time that varies from draw to draw, six balls are released from the sphere, one by one. The order in which these balls are released is ignored, and the numbers on them form the winning combination. As in hockey, the process which generates the outcomes is chaotic rather than essentially stochastic, but the results are effectively stochastic. Great care is taken to ensure that the process is stochastic so that the lottery will be perceived to be fair by the participants.

The global purpose of the lottery system is to make a profit for its owners. This is achieved no matter which combination of numbers occurs in any single draw. Thus, the approximately fourteen million possible combinations form a set of outcomes that are purpose-equivalent with respect to the global purpose of the system. Each participant also has a purpose, that of winning, but this local purpose is served only if the outcome belongs to a small subset of all the possibilities. The local purposes of individual participants are much more likely to be frustrated than to be fulfilled.

From these two examples, the main features of systems incorporating stochastic processes can be identified. Unlike a deterministic process, a stochastic process does not produce a single predictable outcome, but the outcomes are restricted to certain sets of possibilities. Wishing to wager on 51 or  $\sqrt{2}$  in the 6/49 lottery is useless, and even when the geometers play the algebraists, the score will never be " $\pi - e$ ."

When the lottery was designed, the outcome set was consciously decided on, and it contains a fixed number of possibilities. By contrast, hockey developed informally and there is no fixed number of possible scores. Nevertheless, scores in professional games are usually in the single digits, the most goals ever scored in total in an NHL game being twenty-one.<sup>15</sup>

Systems that are very similar may have different purposes. A game of hockey in a recreational league is similar to a professional one. But in the recreational league, no one makes a profit. As well as

wanting to win, the motives of the recreational players may include getting exercise, meeting a challenge, and enjoying the camaraderie of their teammates. Professional players also enjoy exercise, challenges, and camaraderie, but satisfying these motives is the primary purpose of the recreational league.

Global purposes are distinguishable from local ones. Any outcome from the system contributes to a global purpose, but only a subset of outcomes fulfils a local one. For global purposes, all the outcomes are purpose-equivalent, but they need not be equally probable. All the possible six number outcomes in the 6/49 are equally probable, but in the NHL, low scores are more probable than high ones.

## Experimental Design

In scientific research, designs with stochastic features are used in comparative experiments in which the treatments being compared are applied to subjects that are either whole biological organisms, like mice, or groups of organisms, like field plots of raspberries.<sup>16</sup> In simpler designs, each subject receives a single treatment. But even when the subjects come from a homogeneous population, such as an inbred strain of mice, responses to the treatments can vary considerably from subject to subject. If further steps were not taken, the results of such an experiment would be ambiguous. Should the observed treatment differences be attributed to the treatments themselves or to differences among the subjects receiving them? This problem is addressed in two ways. First, each treatment is applied to multiple subjects. Second, subjects are assigned to treatments randomly, that is, by a stochastic procedure. The name of one of the most commonly used designs, the "randomized complete block design," reflects this.

Stochastic assignment allows the effects of the treatments to be distinguished from differences among subjects. It also provides a measure of how precisely treatment effects have been determined and how strongly the conclusions from the experiment should be held.

The research program of which the experiment is a part is the system under consideration. A single experiment is analogous to a single season game in the NHL. The actual stochastic assignment used in the experiment is drawn with equal probability from a set of possible ones. This set may exclude



some assignments that might reflect patterns among the subjects. In experimental design, all the possible stochastic assignments fulfil the researcher's global purposes and are purpose-equivalent. There are no local purposes to be frustrated or fulfilled.

These examples serve as model systems that provide the concepts for understanding more complex situations. This allows a re-examination of van Inwagen's understanding of chance. When he said that a chance occurrence was without purpose and served no one's end, he appears to have been thinking exclusively of local purposes. Thus his statement makes sense when applied to questions such as, "Why did their team win when our team is just as skilled?" His paper was a prelude to addressing the problem of evil, a difficult subject well beyond what is being considered here.<sup>17</sup> However, in one of his examples, he discussed God's decree about the initial arrangement of particles in the universe. There he wrote: "Well, suppose there are various alternative initial arrangements that would suit God's purposes equally well."<sup>18</sup> Surely this describes a set of purpose-equivalent outcomes in all but terminology. This leads to the consideration of physical and biological systems which behave stochastically, and their relation to God's purposes. We will limit our attention to one physical and one biological system.

## Created Systems with Stochastic Features

### Distribution of Matter in the Universe

The observable universe is estimated to contain about one hundred billion galaxies, each containing, on average, one hundred billion stars. This is a lower bound for the size of the actual universe which stretches beyond what we can observe. A notable feature of the current distribution of matter that has been discovered by large-scale astronomical surveys is its filamentous character.<sup>19</sup> These filaments, which form a "cosmic web," contain matter at higher concentrations than elsewhere and are the locations of the galaxies and stars.<sup>20</sup>

Studies of the cosmic microwave background radiation, which reflects conditions in the early universe, indicate that in the earliest times the distribution of matter was highly homogeneous and isotropic though not completely so.<sup>21</sup> The distribution had tiny stochastic fluctuations in density. These fluctuations acted as seeds that were modified by

acoustic oscillations and amplified by gravitational collapse to form the cosmic web. The consequence of these stochastic fluctuations is a rich variety of galaxies and stars and at least one place in the universe that is hospitable to organic life.

The stochastic nature of the fluctuations suggests that the exact distribution of matter in the universe was not fixed. What we observe is a single outcome from a vast set of possibilities, all of which would have produced the large-scale features that we observe, but not the exact details. This leads to the question of whether, when God's purposes are considered, this is a set of purpose-equivalent outcomes. Before attempting to answer this question, the second example will be introduced.

### Biological Evolution

The probability that an organism of a particular species will reproduce depends on how well it functions in its environment. This reflects both antagonistic and synergistic interactions with other organisms of the same and of different species, as well as its interaction with its physical environment. No organism is certain to reproduce, and organisms in a population of the same species in the same environment have different probabilities of reproductive success. This, in modern terms, is what Darwin named "natural selection" by analogy with artificial selection or breeding.

How well an organism functions is related to its genome, which is composed of chains of four different nucleic acids that in the cell nucleus are organized into chromosomes. These chains of DNA contain the codes for proteins, for RNA molecules with other functions, and for regulatory sequences. When the chromosomes are reproduced in cell division, various kinds of changes or mutations can occur. These include additions, deletions, or substitutions of single nucleotides; and deletions, insertions, inversions, and copy number changes in longer stretches of DNA that may contain whole coding regions.<sup>22</sup> At the chromosomal level, possible changes are fusion of chromosomes, inversion of large segments around the centromere, and polyploidy.<sup>23</sup> The latter is most frequently observed in the flowering plants (angiosperms).<sup>24</sup> These mutations vary in amount of DNA involved, frequency of occurrence, and effect on the viability of the resulting organism.

# Article

## *Chance for a Purpose*

Mutations have chemical and physical causes, possibly including quantum effects.<sup>25</sup> But although the biological functioning of an organism is dependent on its underlying biochemical processes, the two are in some sense “decoupled.” The biological functioning of the organism may be said to “supervene” on the underlying biochemical processes.<sup>26</sup> Because of decoupling, mutations are not directed toward any predetermined change in biological function. Their rarity, unpredictability, and lack of biological direction mean that they occur stochastically. This stochastic variation along with natural selection is believed to be the predominant process for producing changes in species over biological history.<sup>27</sup>

During the earth’s history, the physical environment has varied widely because of plate tectonics, large-scale vulcanism, and meteoric impacts. Wide fluctuations have occurred in planetary temperature and atmospheric composition. These changes alter the probabilities of reproductive success of organisms, and result in the modification or extinction of old species and the generation of diverse new ones.

This diversification is offset by the widespread occurrence of convergence.<sup>28</sup> Species with varied histories that fill similar ecological niches may differ greatly in detail, especially biochemically, but converge to similar biological features. Compare, for instance, the whales, mammals that returned to the sea, with the fish that never left it.

The stochastic nature of these processes, along with adaptation and convergence, result in three features of biological life. First is its rich, though not unlimited, diversity. The outcome set of this system is large. Over biological history there have been so many different species that it is unlikely they could have all flourished at the same time. Second is its harmony. Most of the time species are well adapted to their environments. Third is its persistence. Even when catastrophes have wiped out most species, some have always survived to diversify and replenish the earth once more.

Both the distribution of matter in the universe and biological evolution involve processes that are stochastic. Both have large sets of outcomes. But are they consistent with any purpose? To answer this question we must investigate what we know of God’s purposes in creating the universe.

## God’s Purposes

To determine God’s purpose in creating the universe, our first impulse might be to turn to Genesis 1. But this account reads, albeit anachronistically, like a set of executive minutes. It presents decisions made, actions taken, and evaluations of the results. However, it records neither motives nor long-term objectives. The immediate purpose, that of creating a universe, can be inferred from the actions, but why the universe was created is not stated.

As salvation history unfolds, God’s purposes are gradually revealed especially with regard to ourselves. Thus, in the familiar John 3:16, we have, “For God so loved the world [motive], that he gave his only begotten son [action], that whoever believes on him should not perish but have everlasting life [purpose].” Salvation begins with the individual, but it does not end there. In John 17:20–26, Jesus prays that all believers may be one as he and the Father are one. This prayer reflects the unity and glory of the Trinity and desires a similar unity for the church. It anticipates the end of history when our communion with the Trinity will be complete and will, in some way, reflect its own internal relationship. However, God’s purposes extend further than this.

Biblical revelation focuses to a great extent on us, but God’s purposes extend beyond us to the whole of the universe, vast as it is. As Paul says in Rom. 8:20, “the creation itself will be liberated from its bondage to decay.” Reflecting on this passage in light of the whole biological creation, chemist Walter Thorson has written:

From the very beginning, God has deliberately *intended* that all his creatures shall participate, with the various capacities each has, in a “glorious liberty”; otherwise we can make no more than poetic sense of Romans 8:18–25 in relation to the non-human creation.<sup>29</sup>

Why then did God create the universe? This question was studied by the eighteenth-century theologian Jonathan Edwards, whose answer could not have been influenced by modern accounts of cosmology or biology. After an extensive review of Scripture, Edwards concluded that ultimately, God created the universe for his own glory.<sup>30</sup> All subsidiary purposes within the creation lead to this one. Thus God, expressing his own character, voluntarily and wilfully created the universe for his own glory.

In a human, such a motive would be hubris, but this cannot be true for God. His glory is the ultimate glory; there can be no greater.

The universe “declares the glory of God” and was created for this purpose. God’s glory is reflected both in its cosmology and in its biology. But is it reasonable to conclude that stochastically generated outcomes can be equivalent for this purpose? The distribution of matter in the early universe represents one stochastic outcome from a vast set of possibilities. Are they all purpose-equivalent? It seems reasonable to conclude that they are. Any one of them would have fulfilled God’s purposes. Indeed, these fluctuations may be necessary to produce regions of matter at sufficient densities for the formation of galaxies, stars, and planets. And the wide range of densities provides for a rich and glorious diversity of such objects. But beyond this, no particular distribution of matter seems necessary. The actual outcome can be determined stochastically and still be consistent with God’s purposes.

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### The universe “declares the glory of God” and was created for this purpose.

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In the biological world, it is difficult to think of the outcomes as being discrete. The species on our planet change with time and, because of genealogical continuity, blend into each other. The set of outcomes is vast though it is not limitless. Mutations are not directed toward any particular biological function, but only those that are compatible with the current physical and biological environment persist. A consequence of this is convergence, the tendency for unrelated species in similar ecological niches to develop similar functions and appearances.

Biological life on this planet has displayed a richness of diversity which, as with galaxies and stars, declares God’s glory. His creativity is revealed by the multitude of species that have appeared over biological history. The contents of the outcome set have been designed by God. At any time, only a subset of species are compatible with the conditions on the planet. Matching compatible species with current conditions represents a local purpose. But this is continually being achieved. Species flourish over long periods except on those rare occasions when the rate of change is catastrophic. Even then, some life persists.

There would seem to be a flaw in this account. Are not humans, the image-bearing species, a single outcome that is necessary to fulfil God’s purposes? How can we account for the achievement of this local purpose?

The probability of occurrence of a particular outcome during some period in the history of the universe depends on three things. These are the nature of the outcome, the resources that provide opportunities for the outcome to occur, and how God has chosen to act. In the case under consideration, possible outcomes range from humans appearing on Earth to an image-bearing species (us or others similar to us in key ways) appearing somewhere in the universe. God’s image is not physical, and the whole universe is his creation. Resources include the number of planets favorable to life, the ease with which life can appear on such a planet, and the ease with which humans or something like us can appear given the presence of life. In our present state of ignorance, we cannot make definitive statements about any of these.

Finally, there is the question of how God has chosen to act in biological history. Among Christians who accept, possibly with minor modifications, the conventional evolutionary account, the required outcome has often tacitly been assumed to be the appearance of humans on Earth. To achieve this, God has been presumed to guide the evolutionary process in undetectable ways. However, if the goal is less restrictive, it may simply be inevitable given God’s overall design of the creation and its processes. Paleobiologist Simon Conway Morris, for example, thinks that planets congenial to life may be extremely rare, and the appearance of life extremely difficult. But he concludes that once life has gotten started “the constraints of biological evolution and the ubiquity of convergence make the emergence of something like ourselves a near inevitability.”<sup>31</sup> Whatever mechanism God used, this purpose has been achieved. We are here.

The congeniality of the universe for life has often been noted.<sup>32</sup> The values of a few physical constants, such as the gravitational constant and the fine structure constant that controls the strength of interactions between radiation and matter, are not fixed by quantum theory but must be determined experimentally. Yet they are fine tuned. Small changes in the value of any one of them would rule out the



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existence of life as we know it. The possible implications of this anthropic cosmological principle have generated considerable controversy and led to further research in which more than one constant is altered at a time. This research has shown that universes with stars or star-like objects can be produced with some other sets of values for the constants. Whether such universes are compatible with life remains conjectural.

These cosmological and biological processes are consistent with God's purposes. But how, in general, do stochastic processes with purpose-equivalent outcomes fit in with our understanding of God's actions?

## God's Actions


As well as creating the universe, God can be thought of as acting in it in two ways.<sup>33</sup> First, he achieves his general purposes by his uniform divine action in sustaining its orderly, coherent processes. Second, he achieves particular purposes through his special divine action. The latter includes anomalous actions that appear discontinuous with the more prevalent orderly processes of the creation. Such actions are often called "interventions" though this term makes it sound, incorrectly, as though God is not otherwise engaged in the workings of the universe.

In recent years, considerable thought has been given to possible means of special divine action that merge smoothly with the orderly processes of the creation. Two are of interest here. On the most minute level, God may act by determining some or all of the seemingly stochastic outcomes of quantum processes.<sup>34</sup> On another level, God may alter the outcomes of chaotic processes through minuscule perturbations.<sup>35</sup>

Where do processes whose outcomes are determined stochastically from a set of purpose-equivalent possibilities fit into this scheme? It seems quite reasonable to classify them as part of God's uniform divine action. Their existence does not exclude special actions, including anomalous ones, or other uniform actions of a deterministic type. But among the orderly processes of the universe, they have a unique feature. Because multiple outcomes are possible from stochastic processes, God's purposes are being achieved even while the exact course of events is underdetermined.

As a type of uniform divine action, stochastic processes with purpose-equivalent outcomes involve a tradeoff with God's use of quantum or chaotic processes for his special purposes. If God harnesses only some quantum outcomes for his specific purposes, the rest are stochastic, purpose-equivalent ones. Alternatively, if God determines every quantum outcome, there are none left to be purpose-equivalent. The situation for chaotic processes is parallel to that for quantum ones.

While we can propose ways that God might act, we cannot be definite about how he actually does. Such issues lie beyond the reach of our empirical methods. No argument has been given here to demonstrate that any process in the universe actually is stochastic though some apparently are. What has been shown is that if such processes do exist, they do not entail a lack of purpose. These processes were also created by God and serve his goals.

The error that many, including philosophers like Stamos and Rosenberg, make is in drawing their conclusions from the nature of these processes, their stochasticity, and hence their unpredictability. These conclusions reflect only local purposes. An accurate understanding can only be gained by studying the entire set of possible outcomes and the system of which the process is a part. Purposes which will be achieved by the system no matter which outcome occurs, are readily attainable. This does occur in systems of our own construction and can even be seen in mundane activities like sports. Such counter-examples refute the claims of those who are blind to the purposes of chance. 

## Notes

<sup>12</sup> Samuel 1, King James Version. Many modern versions express the lack of intention without using the word "chance."

<sup>2</sup>Peter van Inwagen, "The Place of Chance in a World Sustained by God," in *Divine and Human Action: Essays in the Metaphysics of Theism*, ed. Thomas V. Morris (Ithaca, NY: Cornell University Press, 1988), 211–35.

<sup>3</sup>Jacques Monod, *Chance and Necessity: An Essay on the Natural Philosophy of Modern Biology*, trans. Austryn Wainhouse (New York: Vintage-Random, 1972).

<sup>4</sup>Early responses to Monod were given by theologian Arthur Peacocke in his 1978 Bampton Lectures and by statistician David Bartholomew in Arthur Peacocke, *Creation and the World of Science: The Re-Shaping of Belief* (Oxford: Oxford University Press, 2004); David J. Bartholomew, *God of Chance* (London: SCM, 1984). The latter is now available as an e-book at [www.godofchance.com](http://www.godofchance.com) and has been



- updated as David J. Bartholomew, *God, Chance and Purpose: Can God Have It Both Ways?* (Cambridge: Cambridge University Press, 2008). For references to other works on chance and theology, see Thomas W. Woolley, "Chance in the Theology of Leonard Hodgson," *PSCF* 58 (2006): 284–93.
- <sup>5</sup>Daniel C. Dennett, *Darwin's Dangerous Idea: Evolution and the Meaning of Life* (New York: Simon and Shuster, 1995).
- <sup>6</sup>David N. Stamos, "Quantum Indeterminacy and Evolutionary Biology," *Philosophy of Science* 68 (2001): 164–84; Alex Rosenberg, "Discussion Note: Indeterminism, Probability, and Randomness in Evolutionary Theory," *Philosophy of Science* 68 (2001): 536–44.
- <sup>7</sup>Tamler Sommers and A. Rosenberg, "Darwin's Nihilistic Idea: Evolution and the Meaninglessness of Life," *Biology and Philosophy* 18 (2003): 653–68.
- <sup>8</sup>William Feller, *An Introduction to Probability Theory and Its Applications* 1, 3d ed. (New York: John Wiley and Sons, 1968).
- <sup>9</sup>Alain Aspect, "To Be or Not to Be Local," *Nature* 466 (2007): 866–7; Simon Gröblacher, T. Paterek, R. Kaltenbaek, C. Brukner, M. Zukowski, M. Aspelmeyer, and A. Zeilinger, "An Experimental Test of Nonlocal Realism," *Nature* 466 (2007): 871–5.
- <sup>10</sup>Kathleen T. Alligood, T. D. Sauer, and J. A. Yorke, *Chaos: An Introduction to Dynamical Systems* (New York: Springer-Verlag, 1996); Robert L. Devaney, *An Introduction to Chaotic Dynamical Systems*, 2d ed. (Redwood City, CA: Addison-Wesley, 1989).
- <sup>11</sup>John C. Polkinghorne, *Science and Providence: God's Interaction with the World* (1989; reprint, Philadelphia, PA: Templeton Foundation Press, 2005).
- <sup>12</sup>For other human uses of chance, see Bartholomew, *God, Chance and Purpose*.
- <sup>13</sup>Gary M. Mullet, "Simeon Poisson and the National Hockey League," *The American Statistician* 31 (1977): 8–12.
- <sup>14</sup>This account is based on memories of a long-ago radio interview with a league official.
- <sup>15</sup>Montreal Canadiens defeated Toronto St. Patricks, 14-7, Jan. 10, 1920; Edmonton Oilers defeated Chicago Black Hawks, 12-9, Dec. 11, 1985; "NHL Overall Team Records Most Goals, Both Teams, One Game" [www.rauzulusstreet.com/hockey/nhlrecords/records8.html](http://www.rauzulusstreet.com/hockey/nhlrecords/records8.html) (accessed May 12, 2007).
- <sup>16</sup>David R. Cox, *Planning of Experiments* (New York: John Wiley and Sons, 1958).
- <sup>17</sup>Peter van Inwagen, "The Magnitude, Duration, and Distribution of Evil: A Theodicy," *Philosophical Topics* 16 (1988): 161–87; Report in *Philosophy of Religion: A Reader and Guide*, ed. William L. Craig (New Brunswick, NJ: Rutgers University Press, 2002), 370–93; Peter van Inwagen, *The Problem of Evil* (Oxford: Clarendon Press, 2006).
- <sup>18</sup>van Inwagen, "The Place of Chance in a World Sustained by God."
- <sup>19</sup>Sloan Digital Sky Survey," [www.sdss.org](http://www.sdss.org) (accessed Aug. 24, 2008).
- <sup>20</sup>Claude-André Faucher-Giguère, A. Lidz, and L. Hernquist, "Numerical Simulations Unravel the Cosmic Web," *Science* 319 (2008): 52–4; Rodrigo A. Ibata and G. F. Lewis, "The Cosmic Web in Our Own Backyard," *Science* 320 (2008): 50–2.
- <sup>21</sup>Wayne Hu and S. Dodelson, "Cosmic Microwave Background Anisotropies," *Annual Review of Astronomy and Astrophysics* 40 (2002): 171–216. For more recent developments, see "Wilkinson Microwave Anisotropy Probe" [map.gsfc.nasa.gov](http://map.gsfc.nasa.gov) (accessed Nov. 29, 2008).
- <sup>22</sup>For more details, see Graeme Findlay, "Human Evolution: How Random Process Fulfills Divine Purpose," *PSCF* 60 (2008): 103–14; Elizabeth Pennisi, "Breakthrough of the Year: Human Genetic Variation," *Science* 318 (2007): 1842–3.
- <sup>23</sup>Graeme Findlay, "Homo divinus: The Ape That Bears God's Image," *Science and Christian Belief* 15 (2003): 17–40. Available at [www.scienceandchristianbelief.org/samples.php](http://www.scienceandchristianbelief.org/samples.php) (accessed July 13, 2008).
- <sup>24</sup>A. R. Leitch and I. J. Leitch, "Genomic Plasticity and the Diversity of Polyploid Plants," *Science* 320 (2008): 481–3; Douglas E. Soltis, P. S. Soltis, and J. A. Tate, "Advances in the Study of Polyploidy since *Plant speciation*," *New Phytologist* 161 (2003): 173–91.
- <sup>25</sup>Stamos, "Quantum Indeterminacy and Evolutionary Biology"; Robert J. Russell, "Special Providence and Genetic Mutation: A New Defence of Theistic Evolution," in *Evolutionary and Molecular Biology: Scientific Perspectives on Divine Action*, ed. R. J. Russell, W. R. Stoeger, SJ, and F. J. Ayala (Berkeley, CA: Center for Theology and the Natural Sciences, 1998), 191–223.
- <sup>26</sup>Nancey Murphy, "Supervenience and the Nonreducibility of Ethics to Biology," in *Evolutionary and Molecular Biology*, ed. Russell, Stoeger, and Ayala, 463–89.
- <sup>27</sup>I will set aside the question of whether there are additional processes of importance such as the self-organization of Stuart Kauffman or the intelligent agency of ID proponents. See Stuart Kauffman, *The Origins of Order: Self-Organization and Selection in Evolution* (Oxford: Oxford University Press, 1993); William A. Dembski, *No Free Lunch: Why Specified Complexity Cannot Be Purchased without Intelligence* (Lanham, MD: Rowan and Littlefield, 1993).
- <sup>28</sup>Simon Conway Morris, *Life's Solution: Inevitable Humans in a Lonely Universe* (Cambridge: Cambridge University Press, 2003).
- <sup>29</sup>Walter R. Thorson, "Time and Logical Order in Genesis 1," *Crux* 43 (2007): 30–40.
- <sup>30</sup>Jonathan Edwards, "Dissertation on the End for Which God Created the World," in *The Works of Jonathan Edwards* 1 (1834; reprint, Edinburgh: Banner of Truth Trust, 1974). Available online at Christian Classics Ethereal Library, [www.ccel.org](http://www.ccel.org) (accessed April 10, 2008).
- <sup>31</sup>Conway Morris, *Life's Solution*.
- <sup>32</sup>John D. Barrow and F. J. Tipler, *The Anthropic Cosmological Principle* (New York: Clarendon-Oxford University Press, 1986).
- <sup>33</sup>For a working guide to theological positions on divine action, see Robert J. Russell, "Introduction," in *Chaos and Complexity: Scientific Perspectives on Divine Action*, ed. R. J. Russell, N. Murphy, and A. R. Peacocke (Berkeley, CA: Center for Theology and the Natural Sciences, 1995), 1–31.
- <sup>34</sup>John Robert Russell, P. Clayton, K. Wegter-McNelly, and J. Polkinghorne, eds., *Quantum Mechanics: Scientific Perspectives on Divine Action* (Berkeley, CA: Center for Theology and the Natural Sciences, 2001).
- <sup>35</sup>Russell, Murphy, and Peacocke, eds., *Chaos and Complexity*.

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Ronald G. Larson

# Revisiting the God of the Gaps

Ronald G. Larson

*Although design arguments for the existence of God are sometimes dismissed as God of the Gaps apologetics, reasons for rejecting them based on the history of science, philosophy, religion, and pragmatism are not as compelling as is often implied. I argue that using multiple evidences of design in nature, with regular updates to accommodate new findings, can be a sound and convincing approach to apologetics.*

In several popular recent books, prominent atheistic scientists and philosophers insist that scientific advancement has rendered religious belief irrational.<sup>1</sup> While their arguments vary, I believe that the common themes can be summed up in the following “principles”:

1. *Science is comprehensive.* Given its track record, there is no good reason to doubt that science can eventually address any question that a person can legitimately ask about what exists, including humans themselves.
2. *Science is concise.* Science seeks explanations with minimal presuppositions.
3. *Scientists are courageous.* Scientists reject beliefs that are unwarranted or unneeded, even if those beliefs provide comfort to society or themselves.

These “principles,” along with the modern definition of science as the search for naturalistic explanations, seem to imply that belief in God or supernaturalism in any form is unnecessary, unscientific, and even irrational or cowardly. An atheistic philosophy is thus the hallmark of the good scientist. Or so the authors of recent books would have us believe.

How should this increasingly insistent argument be addressed? One response is to focus mostly on the heart—the seat of affections and moral orientation. While this approach has merit, it must be recognized that the case made for atheism is not solely an intellectual one, but a moral one as well, as indicated by the third “principle” above. From the assertion that belief in God is without intellectual foundation, it is concluded that such belief is nothing more than wishful thinking, and this is immoral as it abandons hard truth for sentimentality.

Another approach is to accept that science can, in time, provide satisfactory answers for anything humans can observe, including their own mental life,

*Using multiple evidences of design in nature, with regular updates to accommodate new findings, can be a sound and convincing approach to apologetics.*

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## *Revisiting the God of the Gaps*

but to argue that there is a second “layer” of explanation that involves God. That explanations involving God are often complementary to, rather than competitive with, naturalistic explanations is no doubt true. However, the success of science is measured not only in how much it can explain, but also by how concisely it can do so, as summarized by the second “principle” above. A major trend in science is the minimization of ontologies or realities needed for satisfactory explanations. Eliminating God from the list of ontologies is a major step in economizing one’s worldview, making it very attractive to scientists.

A final approach, which I take, is to call into question the first of the above “principles”—the notion that all of a human’s observations and experiences can eventually be explained by materialistic science alone. The inadequacy of a materialistic view of what is real can be based on (1) cosmology, such as the apparent “fine-tuning” of the constants of physics needed to produce a universe compatible with human existence; (2) biology, especially the origin of life; (3) humans’ consciousness, and (4) human morality. These arguments, especially the first three, are primarily design (or teleological) arguments. One can find good expositions of them in a number of books, to which I refer any reader seeking details for which there is no space here.<sup>2</sup> All highlight weaknesses in the philosophy of materialistic naturalism held by many scientists.

Some of my colleagues have expressed the view that such an apologetic uses inappropriate God of the Gaps (GOG) arguments. They point out that science is actively seeking explanations for problems of the sort that I (and others) highlight, and, in time, it may find the answers. A related critique is that such an apologetic is an “argument from ignorance,” or fallaciously implies that “absence of evidence” means “evidence of absence.”<sup>3</sup>

To address this criticism, I will first attempt to define how the term “God of the Gaps” is used. I will then argue that, notwithstanding the objections that are sometimes raised, an apologetic based on design arguments such as those mentioned above can be both legitimate and effective. My summary notes that, while such an apologetic can be helpful in clearing away manmade obstacles to faith, it can neither replace the need for faith nor provide a satisfactory theological viewpoint on its own.

## What are God of the Gaps Arguments?

An early GOG critique of apologetics comes from the nineteenth century evangelical Henry Drummond in a lecture he gave on the “Ascent of Man.”<sup>4</sup> In it, Drummond rebukes Christians who point to the things that science cannot yet explain—“gaps which they will fill up with God.” An oft-quoted explanation of the idea can be found in the writings of Dietrich Bonhoeffer:

How wrong it is to use God as a stop-gap for the incompleteness of our knowledge. If in fact the frontiers of knowledge are being pushed further and further back (and that is bound to be the case), then God is being pushed back with them, and is therefore continually in retreat. We are to find God in what we know, not in what we don’t know; God wants us to realize his presence, not in unsolved problems but in those that are solved.<sup>5</sup>

Although prompted especially by resistance to evolutionary theory, Bonhoeffer’s warning can be applied to any argument claiming that deficiency in scientific explanation can count as evidence for God’s design in nature.<sup>6</sup> A recent theopedia entry defines GOG argumentation:

**God of the Gaps** arguments are a discredited and outmoded approach to apologetics, in which a gap in scientific knowledge is used as evidence for the existence of God ... From a philosophical point of view, the inherent problem with a God of the Gaps apologetic is that it relegates God to only a portion of creation—the portion that we do not understand yet ...

From a pragmatic point of view, the main problem with a God of the Gaps apologetic is that the gaps are getting smaller with every passing year ...<sup>7</sup>

Although such warnings are widely noted, and sometimes applied to all design arguments, many scientists continue to use some design arguments while disparaging others as GOG arguments. For example, in his recent book *The Language of God*, Francis Collins explicitly rejects GOG arguments, but attempts to convince skeptics of God’s existence by appealing to (1) cosmological fine-tuning and (2) the existence of a moral law (or the “Law of Human Nature”).<sup>8</sup> At least the first of these is a design argument that can be viewed as a GOG



argument, since scientists are trying to explain fine-tuning naturalistically.<sup>9</sup> The second one might also be viewed as a GOG argument, since scientists are also seeking to explain the emergence of human conceptions of morality through evolutionary theory.<sup>10</sup>

Like Collins, Alister and Joanna Collicutt McGrath, in their rebuttal to Dawkins' recent book, *The God Delusion*, disparage GOG apologetics.<sup>11</sup> To refute Dawkins, they invoke "limits" on science, which they seem to distinguish from "gaps" in that the former cannot, even in principle, be overcome by advances in science. They give the following examples of questions that are beyond the limits of science: "How did everything begin?" "What are we all here for?" "What is the point of living?" However, some argue that science might eventually answer the first of these questions by showing how our universe resulted from a fluctuation in an eternal "multiverse."<sup>12</sup> The second two questions involve purpose and can be considered "why" questions (as opposed to the first, which is a "how" question). Materialistic scientists either dismiss such "why" questions as meaningless,<sup>13</sup> or convert them to "how" questions by seeking to show how human thinking on such questions arose through natural selection.<sup>14</sup>

The effort to dodge questions of meaning and purpose by insisting that "real" knowledge be limited to "objective" scientific categories was exposed as absurd more than fifty years ago by Polanyi,<sup>15</sup> among others. Unfortunately, Polanyi was equally prescient in his assessment of the tenaciousness of scientists' adherence to "objectivist" (or "positivist") philosophy (i.e., "what science cannot discover, humankind cannot know"<sup>16</sup>). Indeed, in my experience, many scientists fail to recognize that their positivist view even constitutes a peculiar philosophical position, rather than being the proper outlook of a scientist. Interestingly, at least some scientists and philosophers find that scientific evidence for design provides compelling grounds for belief in the existence of God. For example, Antony Flew, one of the world's leading atheistic philosophers, recently announced that he now believes in God; his belief is based primarily on the strength of design arguments, such as the origin of life.<sup>17</sup>

Besides the possible difference between "gaps" and "limits," it might be of some use to distinguish between *explanatory* gaps and *continuity* gaps. For

example, it is one thing to claim that a lack of transitional fossils indicates a *discontinuity* in the evolutionary record and another to claim that such transitions cannot be wholly *explained* by natural processes. A similar distinction can be made for the origin of life. In general, claims of continuity gaps are more vulnerable to disproof through scientific discovery than are claims of explanatory gaps. Del Ratzsch has made a similar distinction between design arguments that rely on gaps in "causal history" and those that do not, the latter of which he does not consider to be "gap" arguments at all.<sup>18</sup>

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If there is any consistency in its use,  
it is that "God of the Gaps" is  
a pejorative title for design arguments  
that are deemed unappealing or  
likely to be undone by scientific advance.

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Another distinction might be made between gaps in the ongoing processes of nature and gaps at specific points in natural history. Long ago, Leibniz objected to gaps of the first kind after Newton suggested (erroneously, as the religious skeptic Laplace<sup>19</sup> later showed) that planetary orbits would be unstable unless God intervened regularly to repair them. Leibniz responded as follows:

Nay, the machine of God's making, is so imperfect, according to these gentlemen; that he is obliged to clean it now and then by an extraordinary concourse, and even to mend it, as a clockmaker mends his work ... I hold, that when God works miracles, he does not do it in order to supply the wants of nature, but those of grace.<sup>20</sup>

Leibniz' theological objection to God filling gaps in *ongoing* processes does not seem to apply to miracles God may have used to set up the "clockwork" of the universe. Note that Leibniz could not have known the laws of thermodynamics that imply that the universe is, in fact, "winding down" on cosmological time scales, not mechanically but thermodynamically.

Still another distinction has been made between a "gap on account of nature"<sup>21</sup> (also called a "nature gap"<sup>22</sup>) and a "gap on account of ignorance" (a "sci-

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ence gap"). In the former, the properties of the components and their environment are thought to be understood well enough to conclude that structures made from these components are unlikely to have come about without an external designer. In the latter case, the cause of the structure is unknown, but only because of our ignorance, rather than an inadequate potential in the materials or environment to produce that structure naturally. Obviously, the decision to place a given gap in one or the other of these categories can be controversial.

A perhaps related approach suggests dividing what we do not know into two categories: what is "knowable" and what is "unknowable," assuming natural processes only.<sup>23</sup> It is argued that we rarely know that something is "unknowable" under assumptions of naturalism, and even if we did, that this would be a doubtful reason to appeal to supernatural agency.

Finally, Barr has distinguished design arguments in biology from those in physics and cosmology.<sup>24</sup> It is believed by most biologists, including many of those with religious faith, that natural selection can account for biological structures and, hence, that arguments for design in biology are misguided GOG arguments. Since there are so many other good reasons for belief in a personal God, many feel that biology is not a promising area for apologetics.

Therefore, if there is any consistency in its use, it is that "God of the Gaps" is a pejorative title for design arguments that are deemed unappealing or likely to be undone by scientific advance. For many scientists, any argument for God's existence is a GOG argument. Thus, in most of what follows, I will not distinguish between GOG arguments and design arguments in general, but will survey how much of a threat, or an opportunity, such arguments might present for apologetics. For convenience, I have divided the material into four sections, with overlapping content.

## History of Science

Let me first note that Bonhoeffer urges avoidance of GOG argumentation based on his view of scientific history, in which science is continually "filling in gaps." It is true that some arguments for design in biology, such as William Paley's famous "watch-maker" thesis, are now often viewed as defunct due

to scientific advances. And it is clear that even a superficial view of history should make one hesitant to put limits on what science might discover.

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Flush with success, many scientists hope that a unified "theory of everything" will eventually be discovered.<sup>25</sup> This theory, they hope, might be expressible as a small set of equations, or even a single equation, from which all our laws of physics emerge through spontaneous "symmetry breaking." Moreover, in the most optimistic scenario, the equation will have few, or no, adjustable constants. From this single equation, the evolution of the universe might be predictable, including the emergence of stars and life-supporting planets. Furthermore, it is hoped that steps by which life arose on Earth might eventually be reproduced in the laboratory and shown to be plausible, given known early-earth conditions.<sup>26</sup> It is already widely held that evolutionary processes involving only material interactions are adequate to explain the rise of all organisms, including humans, along with all their cognitive powers.

If science achieves the above, then any apologetic based on its unlikelihood would be exposed as another failed GOG argument. To avoid this, one might restrict apologetics to philosophical arguments, and avoid scientific ones. However, philosophy has had its own historical development,<sup>27</sup> which has shown a weakening in the credibility of at least some arguments for God's existence. In addition, science has rendered some philosophical opinions obsolete. For instance, the view that the earth is the center of the universe, which was grounded as much on Aristotelian philosophy as it was on theology, was falsified through scientific discoveries.<sup>28</sup> Thus, many scientists do not take philosophical objections to scientific progress very seriously. For example, it has been forecast that computers with

cognition similar to, or even much greater than our own, will emerge in a few decades.<sup>29</sup> Such futuristic computers, if they are built, would revolutionize our understanding of the human mind, with unpredictable consequences for philosophy and even theology. The inherent unpredictability of revolutionary advances and their implications for theology suggest that we look again at scientific history to see if science has not only filled gaps, but has also exposed new ones.<sup>30</sup> Indeed, one can find many examples of the latter.<sup>31</sup>

The most compelling fine-tuning arguments are rather recent. For example, consider the following statement from the foreword to a 2006 book by Leonard Susskind, a leading string theorist:

The real mystery raised by modern cosmology concerns a silent “elephant in the room,” an elephant, I might add, that has been a huge embarrassment to physicists: why is it that the universe has all of the appearances of having been specially designed just so that life forms like us can exist? This has puzzled scientists and at the same time encouraged those who prefer the false comfort of a creationist myth ... In the past most physicists (including me) have chosen to ignore the elephant—even to deny its existence. They preferred to believe that nature’s laws follow from some elegant mathematical principle and that the apparent design of the universe is merely a lucky accident. But recent discoveries in astronomy, cosmology, and above all, String Theory have left theoretical physicists little choice but to think about these things ...<sup>32</sup>

Other discoveries over the last one hundred years have had similar effects on other scientists. For example, the discovery that our observable universe had a beginning shocked scientists who had expected an eternal universe, since it seems more compatible with naturalism.<sup>33</sup> The exploration of cellular life in the last fifty years has similarly revealed the “simple” cell to be a wonderland of complexity, challenging the notion that it arose spontaneously.<sup>34</sup> Thus, the notion that scientific history is a tale of continual and irreversible closing of gaps in a fully naturalistic account of nature, is, ironically, yet another argument by theists that has been undermined by scientific progress.

## Philosophy

Despite the pejorative designation, “God of the Gaps,” it is evident that explanatory gaps can be used to show the insufficiency of a particular idea, as has been pointed out by both Larmer and Snoke.<sup>35</sup> Snoke, in particular, has given simple examples of the use of negative arguments or “gaps” in scientific reasoning. An additional, especially relevant, example can be found in the *Origin of Species*, where Darwin argued that the then-prevailing concept of special creation was inadequate to explain many features of living things. These include the differences in flora and fauna in habitats isolated from each other, and the numerous cases of mismatch between structure and function, such as cases of geese with webbed feet living in non-aquatic uplands while grebes with toes joined only by membranes live aquatically.<sup>36</sup> Thus, Darwin argued against special creation, in part, by showing gaps in its explanatory power, which could be filled by an appeal to evolution. If his approach was valid for this purpose, then clearly, gaps in the explanatory power of an idea can legitimately be used to argue against the idea.

As another example, some prominent philosophers believe that there is an “explanatory gap”<sup>37</sup> in the power of materialism to explain human consciousness, and thus infer the existence of a nonmaterial reality underlying it.<sup>38</sup> Materialistic scientists assert that consciousness only *seems* to be nonmaterial because science has not yet shown how material interactions alone can explain it. This argument parallels that of creationists who hold that apparent vestigial structures only *seem* to be unexplained, but that, in time, science may find the functions of these structures. Thus, an assertion that “gaps can be filled” is not a satisfactory response when there are good reasons for doubting its possibility.<sup>39</sup>

Of course, the failure of one naturalistic scenario does not mean that all naturalistic explanations will fail, and one should certainly look diligently for alternative natural explanations. Yet, sometimes such a search leads only to implausible naturalistic explanations. An example of this is the suggestion by Francis Crick, co-discoverer of DNA, who, on considering the difficulty of spontaneous origin of life on earth, once proposed that the first cells arrived in rockets sent here from another planet.<sup>40</sup> Perhaps more persuasively, one could argue that the human mind is not sufficiently imaginative to



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hit upon the most likely naturalistic scenarios. Thus one should always prefer an unknown natural cause to any possible supernatural cause.

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However, if such an approach is valid for science, should it not also hold in other disciplines, such as the historical and archeological sciences? Just as scientific discoveries have forced a re-evaluation of our understanding of the origin of species, so too have they forced a re-evaluation of biblical interpretation. If, as a result of such discoveries, we should learn not to contest the likelihood that the physical sciences will, without invoking God, eventually close all gaps in the history of the cosmos, should we not also assume that the archeological sciences will do the same for biblical history and the origins of Christianity? Indeed, archeological discoveries are being made at a rapid rate and have the potential to transform our view of biblical history.<sup>41</sup> If we apply methodological naturalism to the history of Christianity, and avoid GOG thinking, are we not led to seek to explain the origin of Christianity entirely naturalistically, and so assume that the early church came to believe in the resurrection of Jesus through error, fraud, or legend? To assert otherwise would be to insist on a gap that history and archeology might one day fill, for example, by finding the remains of Jesus' body.

One could argue that GOG arguments should be avoided in the physical sciences, but not in history, or at least not in the history covered by the Bible. However, this special pleading seems arbitrary. As William Lane Craig notes, "The universal disapprobation of the so-called 'God of the gaps' and the impulse towards methodological naturalism *in science and history* [emphasis added] spring from the sense of illegitimacy attending such appeals to God."<sup>42</sup> Thus, a strong resistance to the miraculous in nature is discordant with a simultaneous receptivity to it in history.

The position that naturalistic explanations, even ones lacking in evidence, are preferable to theological ones is a position that has been defended philosophically.<sup>43</sup> But a consistent adherence to this position covering both science and biblical history seems to lead, at best, to a remote, deistic (rather than theistic) view of God or to no God at all. If one is insistent that even glaringly obvious gaps in naturalistic scenarios (such as evidence of fine-tuning or problems in origin-of-life theories) are not reasonable places to see God's design, then why is it reasonable to assert that God's activity can be seen anywhere else, including in biblical narratives?

## Theology

An important source of resistance to GOG arguments is the recognition that the existence of a gap in the ability of science to explain a given phenomenon does not necessarily provide a good basis for theism. Perhaps even more serious is the concern that a GOG *apologetic* might degenerate into a GOG *theology*.<sup>44</sup> GOG theology limits God's activity to the gaps in the natural order, ignoring or slighting his active creating and sustaining of the entire natural order.<sup>45</sup> Christians rightly reject GOG theology, and are right to be wary that a design, or GOG, apologetic might lead to this kind of bad theology. These concerns, I believe, partially account for the resistance of Christian scientists to seize on problems, for example, in evolutionary theory, as evidence of God's workings.<sup>46</sup> Thus, a view that seems to limit God's role to the filling in of a few gaps in the evolutionary record is more problematic for a theist than the gaps themselves are for an atheist.

While I concur with these concerns, I believe that they ought to arise at the tail end of the evangelistic process, rather than at the front end. That is, as we reach out to those who are "without excuse" in failing to recognize God's "eternal power and divine nature,"<sup>47</sup> in grace, we point out indications of the reality of God that might appeal to them, given their present mindset. In this, we are doing no more than God himself did when he exhorted Isaiah to "Lift your eyes and look to the heavens: Who created all these?"<sup>48</sup> In pointing to the stars and asking how they got there, God was not implying that he was not equally the Creator of every blade of grass or mote of dust, nor that it was harder for him to make stars than to make dust. In grace, God was pointing Isaiah's audience to what they, given their



limited understanding, would find to be especially compelling evidence of God's activity. Once God's power over any part of his creation is recognized, his sovereign control over all of it can be more readily acknowledged. This is the essence of apologetics, which should not be confused with the development of a mature theological understanding of God and his interaction with creation.

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What should we make of Bonhoeffer's admonition that we are to look for God in "problems that are solved," not those that are unsolved? Attempting to follow this advice, one might argue that evidence for God is not to be found in any failing of the laws of nature alone to explain all that is, but is rather to be found in the very success of these laws, which points to a God who created such elegant laws and imposes them so uniformly.<sup>49</sup> A key issue, however, is whether the existence of such laws points to a *personal* God, rather than some impersonal force, or even to the laws themselves, as the ultimate reality. Einstein's God, for example, was an impersonal Creator of the cosmos and its laws, as revealed in quotes such as the following:

I believe in Spinoza's God who reveals himself in the orderly harmony of what exists, not in a God who concerns himself with the fates and actions of human beings.<sup>50</sup>

Einstein's belief might be reasonable if there were no evidence that the laws governing the universe have been, in some way, *designed* to produce results consistent with the goals of a personal God. Theists believe that human existence reflects the *intent* of a Creator to produce humans, which he accomplished, in part, through his design of the laws of physics. The recent discovery of indications that the laws of physics are

fine-tuned for human life thus support the theistic view, rather than mere deism.

Might one argue that fine-tuning is not a GOG argument since it deals with the laws of physics themselves, not with the outworking of those laws in nature? But the laws of physics, expressed, say, as differential equations, require initial conditions. Should apparent fine-tuning of an initial condition be regarded as a GOG argument, but not the fine-tuning of the laws themselves? It is hard to see why God might tune the laws of physics, and not the initial conditions. Humans create complex games such as chess from relatively simple rules. The rules for such games not only govern how pieces are moved, but also the initial positions, and the latter are as important as the former. Just as we do not expect an interesting game to emerge from random rules or random initial positions, we should not expect our intricate universe to arise from random laws or random initial conditions. But, for a timeless God, is not specification of conditions at any point in time equivalent to specification of initial conditions? These considerations make it difficult to endorse fine-tuning arguments while summarily rejecting other kinds of design arguments for God's existence, such as the origin of life.

## Pragmatism

Bonhoeffer's critique of GOG arguments suggests that no matter how strong an argument for the existence of God might now seem to be, it is better not to present it if it might be overturned by future science. This expresses a fear that believers in God will lose credibility should their arguments be disproved. It should be borne in mind, however, that no apologetic is holy writ. While surprises may be in store for believers, atheists are likely to be in for some of their own, such as the surprise expressed by Susskind at the evidence for fine-tuning. Few atheists are embarrassed by setbacks, such as the inaccuracies discovered in Haeckel's drawings of embryos that supposedly showed evolution recapitulated in the womb,<sup>51</sup> or the "Piltdown man" fraud.<sup>52</sup> More recently, Dawkins' claim that evolution follows a tree-like pattern, with no exceptions,<sup>53</sup> has proven false, as evidence for "lateral transfers" of genes has accumulated.<sup>54</sup> If arguments for the theory of evolution can be adapted to new findings, why should not arguments for theism be adapted as well? After all, the validity of an idea is determined by the best

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current arguments for it, not the worst outmoded ones. It may be that Christians, who believe in Scriptures that are unchanging, think their apologetics should be unchanging as well. However, an apologetic that bridges an unchanging theology to a changing science must change along with science.

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Furthermore, by preemptively abandoning arguments out of the fear that they might one day be weakened by scientific advance, we risk inadvertently helping to sustain the myth of a continual retreat of theistic arguments in the face of an ever-expanding naturalistic science. To the extent that large, important areas, such as the origin of life, are abandoned as dangerous grounds on which to argue for the existence of God, atheistic scientists feel increased confidence to dismiss any remaining arguments, whether based on science or philosophy, as last-gasp GOG arguments. In this way, an absurdly optimistic outlook on what naturalistic science might accomplish can be built up, like a house of cards, by eminent scientists who should know better.<sup>55</sup>

Because of this, I feel that the origin of life is a pivotal area for apologetics. While other aspects of biology might, at least in principle, be explained by natural selection, it is clear that the origin of life from simple chemicals cannot be. This is because natural selection acts on heritable genetic material, which is not present in the simple chemicals from which life is supposed to have sprung. And yet, many biologists simply annex the origin of life to the origin of species as though it were part of the same overarching theory.

In my view, this should not be allowed to go unchallenged, even though there are plenty of other areas, for example, in cosmology, where God's design is evidenced. The reason is that it leaves


unchallenged the practice of taking naturalistic mechanisms as far as they can go, and when they run out of gas, relying on naturalistic speculation alone to continue the process of "explaining" the universe. One can see this clearly in the astonishingly brazen subtitle of Richard Dawkins' book *The Blind Watchmaker: How the Evidence of Evolution Shows a Universe without Design*. How can Dawkins claim that evidence from *biology* shows that the *universe* has no design? It is by emphasizing that the origin of species is governed by an entirely *naturalistic* mechanism, and then extrapolating this confidence to everything else, *even without providing convincing mechanisms*. Because of its superficial similarity to the origin of species, the origin of life is a *pivotal point* at which the need for a mechanism is dropped and naturalism alone is deemed adequate. Once this step is taken, no phenomenon, whether in biology or cosmology, lies beyond the scope of naturalism, and any claim to the contrary can be viewed as a GOG argument. It is therefore important to mark the point at which insistence on a credible scientific mechanism gives way to glib acceptance of naturalistic speculation.

More generally, the challenge for apologetics is to show the limitations of *undirected* natural forces, without putting arbitrary limitations on the ways God might *direct or supersede* those forces to produce what we observe. I believe that the inadequacy of natural forces alone is indicated by evidence from cosmology, biology (origin of life), humans' consciousness, and morality. I also believe that Scripture testifies to God's special attention to all these aspects of his creation.<sup>56</sup>

## Summary and Final Thoughts

Some design arguments that emphasize continuity gaps in the fossil record or explanatory holes in specific scientific theories perhaps deserve to be dismissed as GOG arguments. Moreover, design arguments should not be allowed to degrade into a "GOG theology" that ignores God's sovereignty as Creator and Sustainer of everything, including what he rules through physical laws. However, considerations from the history of science, philosophy, theology, and pragmatism suggest that broad design arguments for the existence of God can be a legitimate approach to apologetics. Although gaps in naturalistic explanation are sometimes filled by science, other gaps emerge or become wider. Discoveries in

science are unpredictable, *both in their content and in their implications for philosophy and theology*. Believers in a God who created the universe have reason to believe that evidence for his design will always be evident, even if we sometimes mistake how it is evidenced. As Michael Polanyi convincingly argued, all knowledge, including scientific knowledge, contains a “fiduciary” component, and risks falsification.<sup>57</sup> This also applies to the idea that one ought to avoid design (or GOG) arguments for God’s existence, especially since this maxim is neither a scientific finding nor a dogma of the Bible or the church.

Still, we must bear in mind that while God is the ultimate explanation of creation, science only reveals secondary, tertiary, or higher-order explanations.<sup>58</sup> Thus, since we cannot empirically examine the ultimate source of nature,<sup>59</sup> apologetics cannot become an impregnable fortress for belief. Moreover, the Scriptures indicate that it is the Holy Spirit, not apologetics, that produces belief in God’s truth.<sup>60</sup> Apologetics can, however, be used by God to break down manmade obstacles to belief. Since, increasingly, many of these obstacles arise from an inflated view of what naturalistic science is likely to accomplish, I believe that breaking them down can be helped by highlighting limits or gaps that science seems unlikely to overcome, even if this risks using what some would call GOG arguments. 

### Acknowledgment

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### Notes

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- <sup>3</sup>R. Larmer, “Is There Anything Wrong with ‘God of the Gaps’ Reasoning?” *International Journal for Philosophy of Religion* 52 (2002): 129–42.
- <sup>4</sup>Henry Drummond, *The Lowell Lectures on the Ascent of Man* (Glasgow: Hodder and Stoughton, 1904), chapter 10.
- <sup>5</sup>Dietrich Bonhoeffer, “Letter to Eberhard Bethge,” (29 May 1944) in *Letters and Papers from Prison* (New York: Simon and Schuster, 1997), 310–2.
- <sup>6</sup>Richard Bube, *Putting It All Together* (New York: University Press of America, 1995), 60; A. R. Peacocke, *Creation and the World of Science* (Oxford: Oxford University Press, 1979), 78; and Del Ratzsch, *Nature, Design and Science* (Albany, NY: SUNY Press, 2001), 47.
- <sup>7</sup>[www.theopedia.com/God\\_of\\_the\\_Gaps](http://www.theopedia.com/God_of_the_Gaps)
- <sup>8</sup>Collins, *The Language of God*.
- <sup>9</sup>Leonard Susskind, *The Cosmic Landscape: String Theory and the Illusion of Intelligent Design* (New York: Little, Brown, and Company, 2006).
- <sup>10</sup>Jonathan Haidt, *The Happiness Hypothesis: Finding Modern Truth in Ancient Wisdom* (New York: Basic Books, 2006).
- <sup>11</sup>Alister McGrath and Joanna Collicutt McGrath, *The Dawkins Delusion?* (Downers Grove, IL: IVP Books, 2007).
- <sup>12</sup>Susskind, *The Cosmic Landscape*.
- <sup>13</sup>Richard Dawkins, “God’s Utility Function,” *Scientific American* (November 1995); and Bertrand Russell, “Science and Ethics” in *Religion and Science* (Oxford: Oxford University Press, 1961).
- <sup>14</sup>Haidt, *The Happiness Hypothesis*.
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- <sup>16</sup>Russell, “Science and Ethics.”
- <sup>17</sup>Antony Flew with Roy Abraham Varghese, *There Is a God: How the World’s Most Notorious Atheist Changed His Mind* (New York: HarperOne, 2007).
- <sup>18</sup>Del Ratzsch, *Science and Its Limits*, 2d ed. (Downers Grove, IL: InterVarsity Press, 2000), 100–32.
- <sup>19</sup>C. B. Boyer, *A History of Mathematics*, 2d ed. (New York: Wiley, 1968), 538.
- <sup>20</sup>Albert Ribas, “Leibniz’ Discourse on the Natural Theology of the Chinese and the Leibniz-Clarke Controversy,” *Philosophy East and West* 53, no. 1 (January 2003): 64–86.
- <sup>21</sup>Jack Collins, “Miracles, Intelligent Design, and God-of-the-Gaps,” *Perspectives on Science and Christian Faith* 55, no. 1 (2003): 22–9.
- <sup>22</sup>Craig Rusbult, “God of the Gaps: What Does it Mean? Should We Say It?” [www.asa3.org/ASA/Education/origins/gaps-cr.htm](http://www.asa3.org/ASA/Education/origins/gaps-cr.htm).
- <sup>23</sup>Randy Isaac, “From Gaps to God,” *Perspectives on Science and Christian Faith* 57, no. 3 (2005): 230–3.
- <sup>24</sup>Barr, *Modern Physics and Ancient Faith*.
- <sup>25</sup>Susskind, *The Cosmic Landscape*; and Stenger, *God: The Failed Hypothesis*.
- <sup>26</sup>Robert M. Hazen, *Genesis: The Scientific Quest for Life’s Origins* (Washington, DC: Joseph Henry Press, 2005).
- <sup>27</sup>William Lane Craig, *Reasonable Faith: Christian Truth and Apologetics* (Wheaton, IL: Crossway Books, 1994).
- <sup>28</sup>Thomas Kuhn, *The Copernican Revolution* (Cambridge, MA: Harvard University Press, 1957), 87.



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- <sup>29</sup>Ray Kurzweil, *The Singularity Is Near: When Humans Transcend Biology* (New York: Penguin Books, 2005).
- <sup>30</sup>Ratzsch, *Science and Its Limits*, 2d ed.
- <sup>31</sup>Barr, *Modern Physics and Ancient Faith*; and David Snoke, "In Favor of God-of-the-Gaps Reasoning," *Perspectives on Science and Christian Faith* 53, no. 3 (2001): 152–8. Snoke's questioning of the claim that science is "continuing filling in gaps" is quite similar to mine, although he emphasizes the limited number of "gaps" that science has filled, while my emphasis is more on the opening of new gaps.
- <sup>32</sup>Susskind, *The Cosmic Landscape*.
- <sup>33</sup>Robert Jastrow, *God and the Astronomers* (Toronto, ON: George McLeod Limited, 1992); and Barr, *Modern Physics and Ancient Faith*.
- <sup>34</sup>Rana and Ross, *Origins of Life*.
- <sup>35</sup>Larmer, "Is There Anything Wrong with 'God of the Gaps' Reasoning?"; and Snoke, "In Favor of God-of-the-Gaps Reasoning."
- <sup>36</sup>Charles Darwin, *The Origin of Species*, 6th ed. (New York: Prometheus Books, 1991), 135, 304–5.
- <sup>37</sup>J. Levine, "Materialism and Qualia: The Explanatory Gap," *Pacific Philosophical Quarterly* 64 (1983): 354–61.
- <sup>38</sup>David J. Chalmers, *The Conscious Mind* (New York: Oxford University Press, 1996); David J. Chalmers, "Facing Up to the Problem of Consciousness," *Journal of Consciousness Studies* 2, no. 3 (1995): 200–19; and Barr, *Modern Physics and Ancient Faith*.
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- <sup>40</sup>Francis Crick and Leslie E. Orgel, "Directed Panspermia," *Icarus* 19 (1973): 341–6.
- <sup>41</sup>K. A. Kitchen, *On the Reliability of the Old Testament* (Grand Rapids, MI: Eerdmans, 2003).
- <sup>42</sup>Craig, *Reasonable Faith*, 296.
- <sup>43</sup>David Hume, "An Inquiry Concerning Human Understanding," in *The Clarendon Edition of the Works of David Hume* (New York: Oxford University Press, 2000); and Antony Flew, *The Presumption of Atheism and Other Philosophical Essays on God Freedom and Immortality* (New York: Pemberton/Elek, 1976).
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- <sup>45</sup>Alvin Plantinga, "God of the Gaps? (Precisely What Is It?)" [www.asa3.org/ASA/Education/origins/gaps-ap.htm](http://www.asa3.org/ASA/Education/origins/gaps-ap.htm).
- <sup>46</sup>Bube, *Putting It All Together*.
- <sup>47</sup>Rom. 1:20.
- <sup>48</sup>Isa. 40:26.
- <sup>49</sup>Richard Swinburne, "Is There a God?" (Oxford: Oxford University Press, 1997), chapter 4.
- <sup>50</sup>In response to the telegraphed question of New York's Rabbi Herbert S. Goldstein on 24 April 1929: "Do you believe in God? Stop. Answer paid 50 words." Einstein replied in only twenty-five (German) words.
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# Reviewers in 2008

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J. Brian Pitts

# Nonexistence of Humphreys' "Volume Cooling" for Terrestrial Heat Disposal by Cosmic Expansion

J. Brian Pitts

*The young-earth RATE project posits accelerated nuclear decay during the Flood. To dispose of heat, Humphreys appeals to cosmic expansion and Einstein's general theory of relativity. However, cosmic expansion is irrelevant to terrestrial physics. The static gravitational field on Earth conserves terrestrial energy and so is not a heat sink. One can understand why the relevant gravitational field is static from either a matching problem or an averaging problem. In the averaging problem, one averages Einstein's equations over cosmic distances to get effective field equations for cosmic parameters; these equations tend to differ from Einstein's equations due to nonlinearity. The conserved terrestrial energy is derived rigorously using the divergence theorem and tensor calculus. Difficulties with gravitational energy localization might be due to an unjustified assumption of uniqueness, as Peter Bergmann hinted long ago. It is recalled that unwillingness to posit miracles in Noah's Flood was largely a later seventeenth-century rationalist Protestant innovation, making the Flood story empirically vulnerable and contributing to its ultimate rejection.*

Recent work by some prominent young-earth creationists involved in the RATE (Radioisotopes and the Age of The Earth) project has posited accelerated nuclear decay during Noah's Flood to explain the presence of isotopes that are construed by mainstream geologists as indicating decay during much longer periods of terrestrial history. Accelerated nuclear decay, it is conceded by the RATE group, would produce a prodigious quantity of heat in the earth in a short period of time.

Some time ago D. Russell Humphreys proposed a "white hole cosmology" that is supposed to serve the purposes of young-earth creation science by allowing for distant stars to be seen quickly.<sup>1</sup> In fact, the result of positing a bounded

matter distribution (with the matter-filled region being localized and surrounded by a vast emptiness) is simply a modest variant of Big Bang cosmology that provides no help for young-earth creationists' light transit time problem,<sup>2</sup> though it may be of interest for other reasons,<sup>3</sup> including the fact that it suggests a new difficulty for arguing from Big Bang cosmology to theism.<sup>4</sup>

*Einstein's general theory of relativity and the cosmic expansion provide no assistance in disposing of excess heat because terrestrial energy is conserved.*

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## *Nonexistence of Humphreys' "Volume Cooling" for Terrestrial Heat Disposal by Cosmic Expansion*

Recently Humphreys has appealed to cosmic expansion and Einstein's general theory of relativity (GTR) as a mechanism for getting rid of some heat caused by accelerated nuclear decay.<sup>5</sup> However, the phenomenon of cosmic expansion is irrelevant to terrestrial physics, so no heat disposal mechanism is to be found there, as this paper will show.

This paper is not the first criticism of Humphreys' heat sink proposal to appear, but it seems to be the most detailed. Some criticisms of Humphreys' proposal have been published by Glenn Morton and George Murphy.<sup>6</sup> Randy Isaac has observed briefly that expansion-induced cooling does not apply to bound systems (in which the parts do not have enough energy to separate significantly).<sup>7</sup> An exchange between the RATE group and Isaac has occurred recently in these pages.<sup>8</sup> However, a detailed explanation of why the relevant space-time metric in the vicinity of the earth is static (that is, unchanging over time and unchanged by reversing the direction of increasing time coordinate) and how static character entails terrestrial energy conservation, though available in the GTR literature, remains to be applied explicitly in this context. GTR is conceptually and technically intricate<sup>9</sup> in comparison to other classical field theories in physics, such as Maxwell's electromagnetism, so the discussion here might have pedagogical as well as polemical value.

There are two ways of understanding why the relevant space-time metric is static, one from a matching problem, the other from an averaging problem. This averaging problem, which is a matter of current research interest in GTR and cosmology, is relevant to contemporary debates about dark energy as well.

### Cosmic Expansion and the Terrestrial Space-Time Metric

Contemporary cosmology, based on the Robertson-Walker space-time metric, is often glossed as involving the "expansion of the universe." Presumably the "universe" includes the whole physical world, including galaxies and planets and tables, so it is tempting to infer that all physical objects are expanding and are doing so in the same fashion. The question then arises how the expansion can be noticed. For example, measuring the height of an expanding man with a correspondingly expanding ruler would yield a constant height.

In principle, the correct way to treat this problem is to give an exact (microscopic and quantum-mechanical) description of matter with an exact (presumably quantum mechanical) theory of gravity. A demonstrably satisfactory quantum theory of gravity being not yet available, and likely being well approximated by GTR anyway, one naturally relies on GTR, which has proven highly satisfactory both empirically and explanatorily. GTR treats matter as a classical continuum or field, not a quantum field, so some approximation is involved in giving a classical rather than quantum treatment of matter. Furthermore, the variations in density on atomic scales are routinely neglected in successful applications of GTR to macroscopic bodies, such as the planets and sun in our solar system. Thus some sort of implicit averaging must be occurring already in taking the classical limit of quantum physics.<sup>10</sup>

To consider the relevance (if any) of cosmic expansion on a bound system such as the solar system or a planet, there are two plausible approaches, matching and averaging. The matching approach treats the bound system as a localized region with some noncosmological metric (perhaps the Schwarzschild metric outside gravitating bodies) matched to a surrounding homogeneous (the same at all points) Robertson-Walker cosmological metric, like a universe of cheese with one hole. (Hence the term "Swiss cheese" is applied; here the cheese corresponds to the exterior homogeneous Robertson-Walker metric and the hole to the interior inhomogeneous region, which might not be empty of matter itself.)

On this approach, many studies have concluded that the cosmic expansion has either no effect or a negligible effect for small systems. Previously I reviewed a number of these studies.<sup>11</sup> If the space-time metric (which includes the gravitational potential in GTR) in the hole is independent of time ("stationary"), then the energy of the matter with gravitational interaction is conserved. (If the space-time metric is not stationary, then one must also include gravitational energy to get a conserved quantity, and further complications arise.<sup>12</sup>) Conservation of energy implies that there is no mechanism for disposing of heat to be found, *pace* Humphreys. If the earth is taken as the localized body, matched to a surrounding expanding universe, then the energy of the earth is conserved because the time dependence of the terrestrial gravitational field is

negligible. The energy of the earth is also conserved in the more realistic case where the hole in the cheese is larger than the earth.

In calling the effect of cosmic expansion nonexistent or, at most, negligible, I am assuming the expansion rates implied by standard Big Bang cosmology. If Humphreys wishes to appeal to some novel super-fast expansion during terrestrial history, the effects might not be negligible. However, Humphreys then owes us an argument that the effect would be mere cooling of the earth, as opposed, for example, to its disruption.<sup>13</sup>

Of course, the matter outside the solar system, or the earth, or whatever bound system of interest, is not really homogeneous, because there are stars, clusters of stars, galaxies, etc. Thus a fully satisfactory approach would not involve the fiction of replacing the actual matter distribution outside the hole with a homogeneous distribution. Rather, one would take the true inhomogeneous matter distribution and apply a systematic averaging procedure over some distance scales and perhaps time scales to obtain from Einstein's equations a set of equations for the evolution of the *averaged* matter distribution and gravitational field. This project, which saw rather little work until the 1980s, and which has only become popular recently, is called the "averaging problem" in relativistic cosmology.<sup>14</sup> Thus one needs to average Einstein's equations over cosmic distances in order to find equations for the cosmic parameters.

The analogous procedure for electromagnetism in a medium is well-known<sup>15</sup> and comparatively simple due to the linearity of Maxwell's equations and the flat space-time geometry. The cosmic expansion, therefore, is an emergent effect that presumably arises from large-scale averaging of Einstein's equations, much as macroscopic electromagnetism, with constitutive relations between the electric fields  $\mathbf{D}$  and  $\mathbf{E}$  and between the magnetic fields  $\mathbf{B}$  and  $\mathbf{H}$ , arises from averaging microscopic electromagnetism spatially. For Maxwell's equations, the dynamics of the average bears a simple relation to the average of the dynamics, largely due to the linearity of Maxwell's equations; linearity makes the mathematical whole just the sum of the parts. For Einstein's equations, the dynamics of the average bears a complicated relation to the average of the dynamics, largely due to the nonlinearity of

Einstein's equations. Thus the averaged variables will presumably satisfy equations quite different from Einstein's equations in general, whereas the averaged Maxwell electromagnetic equations differ only a bit from the original equations. The curved space-time geometry in GTR makes the addition of vectors at different points path-dependent as well.

While the averaging problem for Einstein's equations is technically involved, the main point needed here, as with electromagnetism, is that *different* gravitational fields are ascribed to the *same* spatio-temporal locations, depending on the distance (and perhaps time) scales employed. When one recognizes that the appropriate space-time metric in the region of the earth depends on the distance scale over which one averages (cosmic vs. stellar vs. terrestrial or the like), one ceases to be tempted to apply the cosmological Robertson-Walker metric at planetary scales as Humphreys does to dispose of terrestrial heat. Given averaging over terrestrial distance scales, again the appropriate metric is independent of time (or very nearly so—the rotation of the earth and the like being insignificant by relativistic standards). Whether or not this calculation has yet been performed using a modern systematic approach to the averaging problem, there is little reason to doubt the outcome. Some authors claim that a careful treatment of the averaging problem can reduce or eliminate the need to posit "dark energy;" this question is a matter of contemporary research.<sup>16</sup>

## Conservation of Energy from Static Metric

Whether one uses the matching approach or the averaging approach, the relevant metric for the earth is independent of time ("stationary"). Because the earth is not changing (at least on scales relevant to this problem), neither is its energy. It is a familiar point from mechanics that time-independent systems conserve energy.<sup>17</sup> In GTR, the notion of being independent of time depends strongly on which four-vector field is used to represent time translation. Time translation involves identifying (largely by stipulation) space-time points at different moments as being in the same place or in different places, among other things. For a stationary space-time metric, there exists a vector field called a time-like Killing vector field. That means that the space-time



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metric tensor  $g_{\mu\nu}$  can be written in a fashion that is independent of the space-time coordinate picked out by the Killing vector field, and that this vector field is time-like with respect to the metric.<sup>18</sup> Stationary character then means independence of time as picked out by this particular vector field. This vector field need not be unique. In the case at hand, the relevant field is proportional to the earth's 4-velocity in the vicinity of the earth. In a coordinate system in which the earth is at rest, this vector field takes a very simple form.

A stronger condition holds in the present context. Whereas a uniform flux in one direction is consistent with stationary character, the relevant terrestrial gravitational field, in fact, does not distinguish (or not much) between the future and past directions. The gravitational field is (to a suitable approximation) time-reversal invariant as well as stationary, and so is called "static." A static metric clearly does not lead to cosmological red-shifting or other energy loss for material at rest in the earth. To a good approximation (by relativistic standards), the earth is a motionless nonrotating solid ball with increasing density toward the middle, static, and, hence, not expanding. With the metric thus unchanging, there is no red-shifting or other energy loss to use up radiogenic heat.

Given these simplifications, one can demonstrate rigorously the conservation of energy for the earth in the following manner. The matter stress-energy tensor  $T^{\mu\nu}$  is covariantly "conserved" (using the matter or gravitational field equations) in the sense of having zero four-dimensional covariant divergence:  $\sum_{\mu} \nabla_{\mu} T^{\mu\nu} = 0$ . (All Greek indices run from 0 to 3, where the 0<sup>th</sup> coordinate  $x^0$  is time and the remaining three coordinates  $x^i$  are spatial, whether approximately Cartesian, spherical, or whatever.) For the time-like Killing vector field  $\xi^{\mu}$ , one has  $\nabla_{\mu} \xi_{\nu} + \nabla_{\nu} \xi_{\mu} = 0$ , where  $\xi_{\nu} = \sum_{\mu} g_{\mu\nu} \xi^{\mu}$ . This equation, which is equivalent to the vanishing of the Lie derivative of the metric  $g_{\mu\nu}$  with respect to  $\xi^{\alpha}$ , shows that the space-time metric  $g_{\mu\nu}$  does not depend essentially on the time coordinate adapted to the Killing vector field  $\xi^{\mu}$ .<sup>19</sup> Because the covariant derivative of the metric is zero ( $\nabla_{\alpha} g_{\mu\nu} = 0$ ), the covariant derivative of the metric's determinant  $g$ , or of  $\sqrt{-g}$ , also is zero.<sup>20</sup> Thus

$$\sum_{\mu} \nabla_{\mu} \left( \sum_{\nu} T^{\mu\nu} \sqrt{-g} \xi_{\nu} \right) =$$

$$\sum_{\nu} \left( \sum_{\mu} \nabla_{\mu} T^{\mu\nu} \right) \sqrt{-g} \xi_{\nu} + \sum_{\mu} \sum_{\nu} T^{\mu\nu} \left( \nabla_{\mu} \sqrt{-g} \right) \xi_{\nu} +$$

$$\sum_{\mu} \sum_{\nu} T^{\mu\nu} \sqrt{-g} \nabla_{\mu} \xi_{\nu} =$$

$$0 + 0 + \sum_{\mu} \sum_{\nu} \frac{1}{2} T^{\mu\nu} \sqrt{-g} \left( \nabla_{\mu} \xi_{\nu} + \nabla_{\nu} \xi_{\mu} \right) = 0, \quad (1)$$

where the Leibniz product rule has been used twice in the second line and the symmetry of  $T^{\mu\nu}$  and the Killing vector character of  $\xi^{\mu}$  have been employed in the last line. Precisely because  $\sum_{\nu} T^{\mu\nu} \sqrt{-g} \xi_{\nu}$  is a weight 1 contravariant vector density, its covariant divergence (with the symbol  $\nabla_{\mu}$ ) equals its coordinate divergence (with the symbol  $\frac{\partial}{\partial x^{\mu}}$ ) and is a scalar

density of weight 1.<sup>21</sup> That result is just what one needs for the divergence theorem in a form suitable for generalized coordinates and hence slightly generalized from that in vector calculus, in order to get results independent of the merely conventional choice of coordinates.<sup>22</sup> (In basic vector calculus, the use of Cartesian coordinates obliterates the distinction between covariant and ordinary differentiation, but in GTR, Cartesian coordinates generally do not exist.) To express the divergence theorem conveniently, two useful bits of notation are  $d^4x = dx^0 dx^1 dx^2 dx^3$  for the element of coordinate 4-volume and  $dS_{\mu} = d^4x / dx^{\mu} = (dx^1 dx^2 dx^3, dx^0 dx^2 dx^3, dx^0 dx^1 dx^3, dx^0 dx^1 dx^2)$  for the element of 3-area of the hypersurface enclosing the 4-volume. Integrating the divergence 4-dimensionally over the relevant part of the earth's history between two moments (and throwing in a minus sign) gives

$$0 = \int d^4x = - \int d^4x \sum_{\mu} \nabla_{\mu} \left( \sum_{\nu} T^{\mu\nu} \sqrt{-g} \xi_{\nu} \right) =$$

$$- \int d^4x \sum_{\mu} \frac{\partial}{\partial x^{\mu}} \left( \sum_{\nu} T^{\mu\nu} \sqrt{-g} \xi_{\nu} \right) =$$

$$- \sum_{\mu} \int dS_{\mu} \sum_{\nu} T^{\mu\nu} \sqrt{-g} \xi_{\nu} =$$

$$- \sum_{\mu} \int dS_{\mu} \sum_{\nu} T^{\mu\nu} \sqrt{-g} \sum_{\alpha} g_{\nu\alpha} \xi^{\alpha} =$$

$$- \sum_{\mu} \sum_{\nu} \sum_{\alpha} \int dS_{\mu} T^{\mu\nu} \sqrt{-g} g_{\nu\alpha} \xi^{\alpha}. \quad (2)$$

Because  $\xi^{\alpha}$  is the time-translation vector field for the coordinates employed, it has components  $\delta_0^{\alpha} = (1, 0, 0, 0)$ , where  $\delta_{\beta}^{\alpha}$  is the Kronecker symbol that is 0 if the values of the indices  $\alpha$  and  $\beta$  disagree and 1 if they match. The static character of the metric implies that  $g_{\nu 0} = g_{00} \delta_{\nu}^0$ . Because the matter in question has vanishing energy flux density, some of the stress-energy tensor components vanish:  $T^{\mu 0} = T^{00} \delta_{\mu}^0$ . Thus

$$0 = - \sum_{\mu} \sum_{\nu} \sum_{\alpha} \int dS_{\mu} T^{\mu\nu} \sqrt{-g} g_{\nu\alpha} \xi^{\alpha} =$$

$$\begin{aligned}
& -\sum_{\mu} \sum_{\nu} \sum_{\alpha} \int dS_{\mu} T^{\mu\nu} \sqrt{-g} g_{\nu\alpha} \delta_0^{\alpha} = \\
& -\sum_{\mu} \sum_{\nu} \int dS_{\mu} T^{\mu\nu} \sqrt{-g} g_{\nu 0} = \\
& -\sum_{\mu} \sum_{\nu} \int dS_{\mu} T^{\mu\nu} \sqrt{-g} g_{00} \delta_{\nu}^0 = \\
& -\sum_{\mu} \int dS_{\mu} T^{\mu 0} \sqrt{-g} g_{00} = \sum_{\mu} \int dS_{\mu} T^{00} \delta_0^{\mu} \sqrt{-g} (-g_{00}) = \\
& \int_{final} dS_0 T^{00} \sqrt{-g} (-g_{00}) - \int_{initial} dS_0 T^{00} \sqrt{-g} (-g_{00}), \quad (3)
\end{aligned}$$

which is the spatial integral of the matter's energy density at final time minus the spatial integral of matter's energy at initial time. There being no dependence on time in the problem, the two integrals are equal. Thus the energy of matter is conserved; it follows that there is no volume cooling. One can be a bit more explicit when the matter in question is an elastic solid.<sup>23</sup> The relevant component of the stress-energy tensor is  $T^{00} = \rho U^0 U^0$  with  $\sum_{\mu} \sum_{\nu} U^{\mu} g_{\mu\nu} U^{\nu} = -1$  for the 4-velocity  $U^{\mu}$  due to the  $-+++$  signature of the metric tensor. Because the earth is at rest in the coordinates employed,  $U^{\mu} = U^0 \delta_0^{\mu}$ . Then  $(U^0)^2 = -\frac{1}{g_{00}}$ . Thus the integrals

appearing in the last line of equation (3) have the form


$$\begin{aligned}
\int dS_0 T^{00} \sqrt{-g} (-g_{00}) &= \int dS_0 \left( \frac{\rho}{-g_{00}} \right) \sqrt{-g} (-g_{00}) = \\
& \int dx^1 dx^2 dx^3 \rho \sqrt{-g}
\end{aligned}$$

evaluated at the final and initial moments, thereby canceling to 0. The factor  $\sqrt{-g}$  provides the analog of the familiar Jacobian factor  $r^2 \sin \theta$  for volume integrals in spherical coordinates, for example.

Another way to discuss the problem of energy conservation is to consider gravitational energy-momentum explicitly rather than (as in the previous paragraph) implicitly. One approach is the method of a gravitational energy-momentum pseudotensor(s), such as one finds in older GTR texts.<sup>24</sup> A fairly nontechnical outline of pseudotensors appeared here previously.<sup>25</sup> The relevant idea described there is that in GTR there is conservation of the combined energy-momentum of gravity and matter together, though typically not of either one separately. When the gravitational energy is unchanging, as in the static earth, the energy of matter is conserved. Whereas Robert Gentry claimed that Big Bang cosmology violated energy conservation and so was absurd,<sup>26</sup> Humphreys claims that Big Bang cosmology provides a sink for terrestrial heat and so is

a resource for young-earth creation science. A fully satisfactory treatment of gravitational energy has not yet appeared, or at least has not been recognized, due to the conceptual intricacies involving individuation of space-time points in GTR. However, there are reasonable notions of energy conservation that apply, *pace* Gentry and perhaps Humphreys. A good recent review is that by Szabados.<sup>27</sup> In some respects, the problem is a conceptual excess of different conserved energies, with equally good claims on being "the" energy (if there is just one true energy), rather than the lack of any conserved energy.<sup>28</sup> It is often assumed that there should be just one energy rather than many energies in GTR, as in other theories,<sup>29</sup> but this assumption is wrong.<sup>30</sup>

## Conclusion

Some historical perspective on Flood geology in relation to natural laws might be useful. Unwillingness to posit miracles somewhere or other in Noah's Flood was largely a later seventeenth-century rationalist Protestant innovation.<sup>31</sup> This move made the Flood story empirically vulnerable and contributed to its ultimate rejection. Perhaps there is a lesson here for contemporary defenders of a global Flood. In any case, GTR and the cosmic expansion provide no assistance in disposing of excess heat because terrestrial energy is conserved. 

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## Notes

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# Athens Meets Jerusalem: Revelation for Philosophers

Robert Prevost



Robert Prevost

**THE AGNOSTIC INQUIRER: Revelation from a Philosophical Standpoint** by Sandra Menssen and Thomas D. Sullivan. Grand Rapids, MI: Eerdmans, 2007. 331 pages. Paperback; \$35.00. ISBN: 9780802803948.

**CROSSING THE THRESHOLD OF DIVINE REVELATION** by William J. Abraham. Grand Rapids, MI: Eerdmans, 2006. 198 pages. Paperback; \$20.00. ISBN: 9780802829580.

Modern audiences typically understand revelation as a category for theology, not philosophy. These authors challenge this assumption. Sandra Menssen and Thomas D. Sullivan provide a straightforward defense of using revelation to defend belief in God's existence. William J. Abraham, working more specifically in the area of epistemology, defends the role of revelation as a basic source of knowledge. I will look first at Menssen's and Sullivan's contribution and then to Abraham's. Finally, I will make a few evaluative comments on these works.

## Targeting the "Tacit Assumption" of Philosophy

Menssen and Sullivan specifically target what they call the "tacit assumption" of philosophy, namely, that one must show that God exists before one can ask whether God has revealed. They understand revelation in a straightforward sense:

We understand a revelatory claim to be any claim, written or spoken, that fits—or can be made to fit—the logical form:  
g revealed to r that p

where g is a supranatural or entirely nonphysical being, a god, let us say; r, the recipient, is an individual or a group of individuals; and p is a propositional content (possibly a very complex, even infinite, content) (p. 69).

The tacit assumption is that a claim to have received a revelation can be evaluated only after the existence of God has been proved. In opposition to the tacit assumption, they make the following claim: If it is not highly unlikely that God exists, then it is reasonable to examine particular claims to revelation from God as evidence for God's existence. It is not highly unlikely that God exists; therefore, it is reasonable to examine particular revelation claims as evidence for God's existence. More boldly, they contend that if the existence of God is not highly unlikely, then a reasonable inquirer must actually examine a number of revelation claims before a judgment can be made that God does not exist.

Menssen and Sullivan provide a straightforward defense of using revelation to defend belief in God's existence. Abraham, working more specifically in the area of epistemology, defends the role of revelation as a basic source of knowledge.

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The book is essentially an extended defense of this argument. It does not itself, for the most part, conduct the investigation into any particular revelation claims; it defends the necessity of doing so before one can reasonably conclude God does not exist.

Menssen and Sullivan divide their book into two parts. In the first part, they make their central case. Consider, they say, the proposal that a single person named Homer was responsible for the *Iliad*. In the course of history, many have rejected that possibility because it was believed that no preliterate person, such as Homer, could have composed such a work. Given the complexity and length of the poem, the argument reasoned, a single individual could have produced it only if that person had the capacity to write. If it were impossible for a preliterate person to produce the poem, no amount of contrary evidence internal to the poem would raise the likelihood that a single person produced it. In other words, the probability of an impossibility is zero and any evidence added to an impossibility does not improve the odds.

Suppose, however, that it were possible for a single individual, in a preliterate context, to produce such a long and complex poem. The probabilities change, and evidence for authorship does matter. Once such a possibility is recognized, then internal evidence derived from the content of the poem itself becomes relevant for judgments about authorship.

Menssen and Sullivan take revelation claims to be closely analogous to arguments about the production of the *Iliad*. If the possibility of God's existence were nil, or next to nil, then no appeal to the internal content of revelation could support belief in the existence of God. On the other hand, if it is not highly unlikely that God exists, then just as it is relevant to look at the content of the *Iliad* to determine authorship, so is it reasonable to look at revelation claims for evidence of God's existence.

Integral to the argument in this first part is their contention that the existence of a world creator is not highly unlikely. Their argument is a simple one: if the universe came into being, then there is a significant probability that there is a world creator. Science shows that the universe had a beginning; therefore, there is a significant probability that there is a world creator. Here they respond to a host of

traditional objections to natural theology based on the notion of causation, such as that the universe might have come into existence uncaused or that an immaterial cause (such as a god) could not have caused the existence of a material universe.

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It is helpful to remember that Menssen and Sullivan are not concerned to show that the fact that the world had a beginning proves the existence of God, something akin to the *kalam* argument. Their purpose goes only so far as to show that there is reason to believe that the existence of a world creator is not highly unlikely. Their concluding section to this argument is particularly interesting in this regard. Titled "The Quiet Concessions of Atheists," this section examines remarks by three prominent atheists, Quentin Smith, Richard Dawkins, and Antony Flew, to the effect that there are reasons to think that a world creator exists.

Menssen and Sullivan devote the second part of the book to discussing four general objections to their argument. The first objection is a version of the problem of evil: Given the magnitude of evil in the world, it is highly implausible that a creator of this world would be good; it is, therefore, highly implausible that an appeal to revelation will show that a good god exists. Though Menssen and Sullivan do not believe that an adequate response to the problem of evil can be given without appeals to revelation, they believe it is also possible to discuss a priori, if you will, in a very general way what a world creator's character would be like. In this context, they discuss a host of traditional topics, such as Hume's suggestion that evil in creation points to an evil creator, the problem of construing evil as a means to another end, and the problem of determining how much evil a good god would allow.

The second objection contests the possibility of evaluating revelation claims. The argument is that no plausible philosophical method exists that would enable us to evaluate revelation claims, so the attempt to do so is futile. Here Menssen and Sullivan enter into an extended discussion of "inference to

the best explanation." In my judgment, this discussion is among their most important contributions.

Many others have suggested that Christian theism is best understood as a large-scale explanation of some kind. Drawing upon the most recent discussions of best-explanation arguments, Menssen and Sullivan give a more detailed account of how this might be. Three aspects of their treatment are particularly helpful. First, they recognize the role of an "organizing framework" for dealing with a large set of diverse data. They do not say it this way directly, but this seems one way in which a large-scale theory explains: by providing an organizing framework that accounts for the existing data and provides an intelligible narrative for new data.

Second, inevitably, evaluation of explanations will involve subjectivity. Menssen and Sullivan speak of the "ineliminable subject." Here one is reminded of Basil Mitchell's description of the role of judgment in his *Justification of Religious Belief*.<sup>1</sup> I am not sure that this is as problematic as Menssen and Sullivan take it to be. By way of preempting the discussion below, I would suggest that the alleged problem of subjectivity is a holdover of a discredited approach to epistemology, namely, epistemic methodism. Rational inquiry by its nature works, broadly speaking, inductively where no formal calculus exists for evaluating the weight of evidence.

Third, Menssen and Sullivan recognize the specific problem of using controversial data as the basis for an inference to the best explanation. One could hold that such explanations have weight only when the data to be explained are evident to all. Menssen and Sullivan argue that a theory can have real explanatory power, even if the data explained are *putative* facts. Putative facts are quasi-facts that "fall short of being 'observations' or 'givens'" (p. 208). Menssen and Sullivan call the kind of putative facts important for their case "Conditional Upon Explanation" facts, or CUE-facts for short. Explanations often both identify facts not otherwise known and explain their existence at the same time. If the explanation did not stipulate the fact, the fact would not be known; and at the same time the evidence for the fact is its explanation. The point is that there is nothing problematic for explanations involving CUE-facts.

The third objection to their central argument follows on the second by way of suggesting that

religious explanations of putative revelation claims are never good ones; hence, even if God's existence is not impossible, there will be no reason to appeal to God's existence as an explanation for the content of any particular revelation claim. Science, history, psychology, and other nonreligious perspectives will simply provide better explanations for any putative claim to revelation.

In responding to this objection, Menssen and Sullivan come as close as they ever do to making a substantive argument for the truth of Christian revelation. They point out that religious explanations can be very powerful. They illustrate their claim using two political values: political equality, on the one hand, and human rights, on the other. As they describe these values, "humans are all in some sense basically equal, and all humans have certain inalienable rights" (p. 251). Menssen and Sullivan draw attention to the importance of these two concepts for liberal societies, despite the fact that they are not evident in the same way as, say, the computer in front of me is. How then can the reality of political equality and human rights be defended? Menssen and Sullivan believe that they are best described and defended as CUE-facts, facts conditional upon being explained. Reasonably defending human equality and human rights as facts depends crucially upon having a reasonable explanation of those putative facts. Moreover, drawing upon recent work, such as Jeremy Waldron's *God, Locke, and Equality: Christian Foundations in Locke's Political Thought*, they argue that the only reasonable explanation of those facts derives from the content of Christian revelation, particularly the Christian focus on the *imago Dei*.<sup>2</sup> For this reason, human rights and equality are evidence for the truth of Christianity. This supports their claim that religious explanations can be good ones.

A final objection is that religion is about faith, and faith requires resolute belief that goes beyond the evidence. For that reason, the appeal to revelation understood as a rational claim is undermined. This is an ethics of belief issue: one ought to proportion one's belief to the evidence, and because faith requires one to go beyond the evidence, it is always wrong to have faith. Menssen and Sullivan address this objection by a two-fold response. First, they note the importance of context to the proportionality requirement itself. Sometimes, one's belief must go beyond the evidence. One may have a duty to



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hold a belief “fixed” despite the available evidence at the moment. For example, they claim, the available evidence may point to the guilt of a close friend, but we have a duty for the sake of our friendship to deny guilt and to hold resolutely to belief in the friend’s innocence, at least over the short haul. Second, they argue that faith fits the pattern of contexts where belief must be resolutely maintained in the face of counter evidence. In that fashion, they argue that resolute belief is not incompatible with a proper understanding of proportional belief.

### Revelation’s Epistemic Status within Christian Theism

William J. Abraham examines a different, though obviously related, aspect of revelation: its epistemic status within Christian theism. This issue is a particularly complex one for Abraham for two reasons. First, as part of a larger project defending what Abraham calls “canonical theism,” he distinguishes epistemology from canon.<sup>3</sup> Canonical theism, according to Abraham, is

the version of theism embodied in the canonical heritage of the church, [which is] a network of materials, practices, and persons brought into being by God within the Church and intended to heal our wounded and rebellious selves (pp. 15–6).

Canon, on this view, is more than the Bible alone. It extends to the church, the creeds, the liturgy, to the sacrament and even to the identification of saints. Crucially important is Abraham’s claim that the Christian canon exists as a means of grace, which enables corrupt human creation to enter into friendship with God. For Abraham, canon is not an epistemological category.<sup>4</sup>

Since the thirteenth century, western antagonists, for various historical and theological reasons, attempted to make particular epistemologies definitive for Christian theology.<sup>5</sup> By Abraham’s lights, this has been a disaster because it subjects the canonical faith to the vicissitudes of the particular epistemology “canonized.” Consequently, the church’s missteps in epistemology have left it vulnerable to attack on the reasonableness of its canonical doctrine, which is, as Abraham describes it, essentially a “rich vision of God, creation, and redemption” (p. 15).

The second reason for the complexity of the issue of revelation’s epistemic status concerns the nature of epistemology itself. To be clear, Abraham affirms the value of epistemological inquiry in theology. Epistemology is concerned primarily with standards of rationality, justification, and knowledge. Abraham believes that the canonical theist is rational, is justified in believing the defining doctrine of canonical theism, such as Trinitarianism, and knows that these doctrines are true (p. 5). By separating canon from epistemology, he is not negating the value of epistemology for Christian theology. Rather, he objects to a particular construal of epistemology that has dominated the western philosophical tradition for centuries, if not millennia. The problem is, as I understand Abraham’s view, if one gets epistemology wrong, then one will be, in principle, incapable of adequately understanding, much less evaluating, the rationality and justification of canonical theism.

Abraham’s work can and should be seen as a contribution to recent discussions of epistemology initiated by Alvin Plantinga’s articulation of a Reformed epistemology.<sup>6</sup> Abraham enthusiastically endorses its attack on evidentialism; and, to a large degree, Abraham’s argument in this book is possible because of the critical work of Reformed epistemology, and of others to be sure, forcing a rethinking of epistemology. Nonetheless, he believes it fails to account fully for the rationality of Christian belief and doctrine.

As Abraham understands the claims of Reformed epistemology, the rationality of Christian doctrine such as Trinitarianism is

secured by the proper functioning of the *sensus divinitatis* implanted within us at creation by God and repaired in redemption by the work of the Holy Spirit (p. 47).

This reliance on the *sensus divinitatis* for epistemic warrant is problematic for several reasons. First, it ignores history. The doctrine of the Trinity developed from the church’s struggle with soteriology and its vision of the human condition. Second, the appeal to the *sensus divinitatis* itself involves a complex set of theological commitments regarding anthropology, soteriology, and pneumatology. It is not evident why one theological doctrine, e.g., the internal witness of the Holy Spirit, should be epistemically privileged over the doctrine of the Trinity.

More work needs to be done. Finally, it seems odd to rely on the *sensus divinitatis* for warrant to the exclusion of other reliable epistemic practices, such as perception, memory, reason, and the testimony of the church and the biblical writers.

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The interplay of these two themes sets the stage for Abraham's project in this book. In order to avoid the problems that come with canonizing an epistemology and to assess accurately the rationality of Christian theism, epistemology itself must be reconceived. Once that is accomplished, Abraham can mine the canonical heritage of the church itself for resources of epistemic warrant for its claims, particularly its commitment to divine revelation.

At this point, I will register the limitations of this review. If one is familiar with Abraham's previous work, one understands that he is marvelously adept at "thinking outside the box" in creative and insightful ways. This book is no exception. It is absolutely chock-full of nuanced analysis, drawing connections with unexpected issues and developing arguments in unexpected ways. It would be impossible for me to detail this in any significant degree. What I will do here is to relate what I think to be the main themes of the book as Abraham develops them.

In the first three chapters of the book, Abraham discusses epistemology proper. Abraham begins by criticizing what he calls the "standard strategy" in epistemology, which is, first, to work out a general theory of rationality and justification and then, second, to examine how well theism does or does not satisfy the general theory. As he states it, this view "leaves theology at the mercy of the prevailing options in contemporary philosophy" (p. 9).<sup>6</sup> Moreover, according to Abraham, it ignores the many epistemic suggestive elements of Christian theism and assumes that Christian theism is in some way epistemically deficient.

Abraham argues that the "standard strategy" is a form of epistemic methodism.<sup>7</sup> Briefly stated, epistemic methodism identifies a particular method for justification and requires all rational belief to be justified according to that method. Descartes, it is often said, represents the paradigmatic epistemic methodist. Another example, I would suggest, is the contemporary bias toward scientific method. Read anything by Richard Dawkins.

Epistemic methodism, however, has its problems. Any claim to have identified the proper method must itself satisfy its own requirements. This has been notoriously difficult to do, and epistemic methodism ends up hoisted on its own petard! As Plantinga has famously argued regarding one kind of epistemic methodism, strong foundationalism, restricting the proper foundations of knowledge to a particular kind of belief, such as propositions evident to the mind or to the senses, cannot be justified by an appeal to propositions evident to the mind or to the senses.

The alternative is epistemic particularism. Epistemic particularism does not begin with method, but with actual knowledge. As Abraham states it, the problem for particularism is not how little we know, but how much we know (p. 34). One could not even begin to detail all that which we obviously know: "Today is a warm day in September," "Today's sermon was unusually long," and on and on. The task for epistemology is to illuminate the knowledge we already possess, to clarify crucial epistemic concepts, and to render our common practices intelligible.

It is hard to overestimate the significance of adopting particularism over methodism. First, it makes irrelevant certain kinds of questions about the relationship of our best epistemic practices to truth. The history of epistemology has, in part, been a reaction to the skeptic's challenge: how can our best epistemic practices guarantee the truth of our beliefs? The argument is that, unless that guarantee is there, we cannot claim to know anything. This question troubles epistemic methodists, but not epistemic particularists. Since particularism starts with knowledge, it is simply a non-issue.

Second, and maybe more importantly, particularism inevitably broadens what can be considered legitimate standards of rationality, justification, and

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knowledge. This, I think, is the point of Plantinga's discussion of the "Great Pumpkin" objection, and it applies here.<sup>8</sup> That objection challenges Reformed epistemology to provide some basis for properly distinguishing basic from nonbasic beliefs. As Plantinga notes, to do this, we must proceed inductively. By examining a stock set of examples of recognized knowledge, we can identify features that are epistemically important.

The necessity of proceeding inductively is the key. Because this is not epistemic methodism, one cannot eliminate a priori, as it were, suggested examples of recognized knowledge. But this is where it gets problematic: How do you choose the stock set of examples? Christians will have one set and non-Christians another. Though these may overlap at points, many choices will be controversial. Nonetheless, controversy does not detract from their appropriateness.

What emerges from particularism is what Abraham describes as a conception of "epistemic fit" (p. 29). There will be many competing claims to knowledge, and we cannot expect those claims to satisfy a single method. Rather, because we proceed inductively, we must allow each respective side to make the kind of argument that is appropriate, or fitting, for its proposal. Abraham notes,

[I]n the end each network of beliefs must be taken in its radical particularity. The fit between the claims advanced and the positive intellectual case made may be singular and unique. We are thus entitled to work our way outward from within the theism on offer, take seriously the kind of epistemic suggestions advanced by the ordinary believer and in the canonical heritage of the church, and see where this takes us in the discussion (p. 45).

In the balance of the book, Abraham develops the "epistemic suggestions" of canonical theism that ground the rationality of the canonical theist and that justify accepting canonical doctrine. Canonical theism is "constituted by a network of interrelated propositions that need to be taken as a whole." (p. 43). This network involves many diverse components, including an ontology, a metaphysic, a vision of life's meaning, a historical narrative, a morality. It also, for Abraham's purposes, includes a rich tapestry of epistemic categories. Abraham states, "Of all the epistemic suggestions that lie buried

in the canonical heritage of the church, this is the single most important component" (pp. 56-7).

Though the canonical heritage, for Abraham, as noted above, is primarily a means of grace by which God heals human nature, nonetheless, it makes claims about God and his activity in history. The issue of divine revelation, then, arises naturally from the fundamental commitments of canonical theism. Divine revelation, for Abraham, is the central "stock example," if you will, of recognized knowledge within canonical theism, and his task will be to clarify, and make intelligible, its epistemic role.

In chapter four, Abraham initiates his discussion of the epistemic character of revelation and introduces the *oculus contemplationis*, the capacity of human beings for immediate awareness of God. Revelation is essentially about disclosure (p. 84). Abraham makes the analogy to ordinary contexts of human interaction: As human persons reveal themselves to others by what they say and what they do, so God reveals himself in word and action in history, and chiefly in the Incarnation and the events of redemption. God does this in manifold and diverse ways; hence, Abraham describes revelation as "polymorphous." He concludes:

A Christian account of divine revelation will gather up all that God has done to reveal himself to the world and relate it in rich and various ways both to the means of grace that transmit divine revelation and to the tasks and projects of ecclesial and everyday existence (p. 65).

The epistemic import of revelation is dependent upon the human capacity to discern it. Here Abraham draws upon another element of the canonical heritage, the notion that one has immediate, non-inferential awareness of "the reality of God in our inner experience and in our encountering the world" (p. 66). Abraham calls this capacity the *oculus contemplationis*.

This capacity, Abraham believes, is basic, comparable to other basic cognitive capacities. Our perceptual capacities, for instance, are basic cognitive acts through which we develop true beliefs. Another instance of this class of basic acts is our ability to recognize other human agents as agents and not as automatons. This latter capacity is very important because it serves as the analogue to our capacity to recognize God's revelation. In each case, these capacities produce warranted, non-inferential be-



liefs. In the case of the *oculus contemplationis*, the capacity produces beliefs about the reality of God and the presence of divine revelation.

It is important to highlight the role the *oculus contemplationis* plays for Abraham. He locates it within a perspective of basic capacities that shifts the burden of proof to one who would challenge its product. In a footnote, Abraham draws attention to the role of the principle of initial credulity in the work of Richard Swinburne.<sup>9</sup> The idea is that absent a reason to doubt our basic epistemic capacities, things are likely to be as our basic capacities show them to be. So it is with the *oculus contemplationis*.

The default position is this: in the absence of good arguments to the contrary, we recognize straight off God's general revelatory activity in the world and within ourselves (p. 67).

As a consequence, Abraham affirms with Reformed epistemology that our knowledge of God will not generally be based on evidence. We do not hypothesize the existence of God to explain data supplied by our other basic cognitive powers. Our ability to recognize God is a basic cognitive capacity.

Abraham's next task is two-fold. First, he wants to show how the *oculus contemplationis* and revelation might illuminate nontheological knowledge of the world, or as he says it, whether it "can then be found to cohere with other things we find out about the world." This will be important for Abraham for two related reasons. On the one hand, it will be important for his defense of the epistemic value of revelation that it not conflict with other recognized sources of basic knowledge; on the other hand, he must not repeat the mistake of Reformed epistemology by making other recognized sources of basic knowledge irrelevant to the development of Christian doctrine. Second, he wants to show how this epistemic category helps account more adequately for the development of canonical doctrine and, in particular, the doctrine of the Trinity.

In chapter five, Abraham introduces the idea of the "threshold" of revelation (p. 85). The metaphor of threshold is spatial or geographical, and it conveys the notion of a complete alteration of perspective as the result of crossing the threshold. Abraham's point is that once one has received revelation, it is a life- and world-changing event. He identifies four features of this altered perspective:

First, it is often the result of a dramatic conversion; second, the disclosure contained in the revelation has to be received as knowledge, not opinion; third, it evokes a response of allegiance, requiring a "response of loyalty, trust, and persistence"; and fourth, revelation will necessarily illuminate every aspect of one's existence (p. 87).

Abraham discusses at various points how crossing the threshold of divine revelation enhances our trust and understanding of our cognitive capacities.<sup>10</sup> In one particularly interesting illustration of this, he cites the example of Descartes who used the existence of God to establish the reliability of our ordinary cognitive capacities. This makes perfect sense from the standpoint of one who has crossed the threshold of divine revelation. Abraham describes it as a "loop-back effect leading to a reconceiving of the cognitive capacities that brought one to divine revelation in the first place" (p. 88).

In chapter six, Abraham utilizes the notion of "crossing the threshold of revelation" to deliver an epistemology of theology, an account of the epistemic role of revelation in the development of doctrine. Over time, God's revelation constantly alters and enriches our understanding of God. God reveals himself in and through the creation of the nation of Israel with all its practices of devotion and worship, its style of leadership, and its rich canon of Scripture. Most importantly, it is the impact of revelation on that community that enables the community to recognize and receive the revelation of God through Christ, which is again completely world-altering. In response to that revelation, the community of Jesus develops its own practices of devotion and worship, styles of leadership, and a rich canon of Scripture.

It was in this context that the foundational Christian dogmas such as the doctrine of the Trinity arose. Abraham describes it this way:

[T]he doctrine of the Trinity arose over time out of the deep interaction of the special revelation of God in Israel, the extraspecial revelation of God in Jesus Christ, experience of God in the Holy Spirit, and sanctified creative imagination and reason. It is radically incomplete and inadequate to trace the kind of revolutionary change in the doctrine of God represented by the Nicene Creed merely to the divine revelation enshrined in scripture (p. 106).

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## *Athens Meets Jerusalem: Revelation for Philosophers*

It is instructive to contrast this understanding of the epistemic ground of canonical doctrine with that suggested by Reformed epistemology's use of the *sensus divinitatis*. In Abraham's view, the development of doctrine requires a historical sequence of revelation, crossing a threshold, assimilating and deepening one's understanding of God, then more revelation, crossing another threshold, further assimilation of the content of revelation, and so on. What we have as the canonical doctrine develops out of God's disclosure of himself in revelation and its impact on the lives of the recipients of that disclosure, all the time aided and directed by the Holy Spirit. Revelation is indispensable in this process. By Abraham's lights, it would be radically incomplete and inadequate to describe our knowledge of God as Triune as a basic belief.

To this point, Abraham has argued for an epistemology of the theology of canonical theism that he believes frees it from its "captivity to restrictive and disputed epistemological theory" (p. 114). The entire canonical heritage, on this view, mediates God's self-disclosure, not just scripture. Now he returns to an earlier theme of demonstrating the coherence of revelation with other modes of basic cognitive practices. He addresses a number of topics here. In chapter seven, he examines more thoroughly the impact of revelation on one's understanding of basic cognitive capacities and on one's interpretation of evidence and counter-evidence. He notes a number of important effects of revelation, including, among others, a more robust appreciation of one's ordinary cognitive capacities such as perception, a greater confidence in the recipient's sense of God's presence in his or her life, and, my favorite, a greater appreciation for "the inner logic of the ontological argument."

In chapter eight, Abraham addresses the obvious existence of counter-narratives. After a very nuanced account of various levels of belief and unbelief, he discusses the possibility of true loss of faith. Revelation does not insulate the believer from criticism. Given the context of modernity, there will always be someone who offers a counter-narrative to explain the experience of the believer who has received alleged revelation. As one can step across the threshold of revelation, so one can step back across the threshold, reinterpreting one's experience in a decidedly non-Christian way.

This reality leads Abraham in chapter nine to a more formal discussion of the possibility of epistemic defeaters and objections to his proposal. Abraham is quick to admit the possibility that evidence will present itself that can defeat the claims of Christian theism, and he discusses the kinds of evidence that would tell against it. However, he rejects the claims of what he calls "global defeaters": first, that conflicting claims to revelation cancel one another out; or, second, that claims to revelation can be generally rejected because they are often motivated by evil purposes. Here he returns to his epistemic particularism. There is no substitute for examining particular claims of particular religious traditions. The arguments of one tradition will not be the arguments for another. He concludes, "Relevant defeaters and objections against this or that particular claim must be laid out and argued in detail" (p. 154).

In the final chapter, Abraham returns to the issues of rationality, justification, and knowledge. Drawing upon recent work in virtue epistemology, Abraham argues that rationality is first and foremost a character trait, one which is more or less embodied in individuals. Christians, according to Abraham, will exhibit the same degrees of rationality and reasonableness as non-Christians. Most importantly, according to Abraham, absent relevant defeaters, there is no reason to doubt the full rationality of the mature Christian believer.

Indeed, he concludes, the mature Christian believer has grounds for claiming to know that Christianity is true. Revelation secures the doctrine. In an earlier section of the book, Abraham illustrates the way this would proceed:

When called upon to explain why we think the creed is true, we can and should appeal to the place of divine revelation in Israel and in Jesus. However, we should also draw attention to the place of religious experience, to the use of sanctified imagination and reason, and to the promise of God to grant the Holy Spirit to the church and lead it into the truth. We should without apology and embarrassment display our reliance on the *oculus contemplationis* as a bedrock capacity given us in creation to perceive the truth about God (p. 111).

Abraham's point is that this can give a justification for a mature Christian's belief. And again, absent

relevant defeaters, this secures knowledge for the canonical theist. Given the nature of God, if God reveals, what he reveals will be as secure epistemically as any other knowledge claim.

## Evaluation and Recommendations

For those particularly interested in a philosophical evaluation of revelation, I recommend both volumes highly. Menssen's and Sullivan's book is, in a way, the less ambitious of the two. It has a very narrow focus, the defense of a single conditional, but covers the ground very thoroughly, amazingly so. In fact, because of its organization, clarity, and breadth, it could be used as a textbook for an undergraduate class in contemporary analytic philosophy of religion.

Abraham's book, on the other hand, will be less useful for a typical undergraduate, though immensely interesting to graduate students and professionals in the field. Its argument is extremely complex and assumes more on the part of the reader's background knowledge. If I have a complaint, it is that Abraham tries to do too much in too few pages. Nonetheless, it is a highly original piece and deserves serious study by philosophers and theologians alike. Abraham offers, almost uniquely in my view, an example of how epistemology must be done "after methodism." Through the extensive use of "narrative with epistemic commentary," he offers fitting examples of the epistemic practices of canonical theism, which center around the reception of revelation. He then carefully delineates how defeaters and objections can be raised against his particular epistemology of theology, and invites critical reflection on his suggestions.

How can we relate these two books? Obviously, both are concerned with the philosophical analysis of issues relating to revelation. However, there is an interesting tension between the two books. Menssen and Sullivan explicitly construe revelatory claims as explanations to be evaluated in part by their explanatory power, while Abraham wants to take revelation claims as analogous to perceptual claims, veridical until proven guilty. Menssen and Sullivan suggest, insofar as their task is an apologetic one, a common frame of epistemic reference between theists and agnostics, while Abraham suggests a certain kind of incommensurability between rival versions of theism and atheism reminiscent of MacIntyre's tradition-based conception of rationality.<sup>11</sup>

One way to resolve the tension is to recognize that Menssen and Sullivan speak to a different audience from Abraham. To use Abraham's terminology, Menssen and Sullivan address those who have not crossed the threshold of revelation. For those who have crossed the threshold of divine revelation, who stand within canonical theism, who understand what the *oculus contemplationis* is and know of no successful defeaters, they are justified in claiming that they know that God exists. But what of those outside canonical theism? They, the "agnostic inquirers" as Menssen and Sullivan describe them, want to know whether canonical theism is true. An appeal to the *oculus contemplationis* will be unhelpful because the debate is precisely over the reality of the capacity.

I suggest, *contra* the protestations of Abraham and Reformed epistemology, that in this context, the conception of theism as an explanatory theory is helpful. Abraham goes to great lengths explaining the defeasibility of canonical theism's claims to revelation. He writes:

Claims to divine revelation can be undermined and falsified; they can be subjected to strain; they can be overturned by a review of the status of our cognitive capacities; they can be challenged by the undercutting of the evidence advanced in their favor, or by new evidence (p. 143).


Note, though, that this kind of challenge will not follow a formal calculus. One can only look at data and the proposed explanation and make a considered judgment on the weight of the particular claims. In other words, the process will be dialectical, where part of the judgment is over which rival best accounts for experience.<sup>12</sup> It is not infelicitous to describe this "accounts for" as an argument to the best explanation.

For this reason, Menssen and Sullivan provide support for a rational defense of canonical theism in at least two ways. First, their discussion of CUE-facts mitigates any appearance of arbitrariness of the canonical theism's central epistemic commitments. Remember that they argue that "conditional-upon-explanation" facts are neither unusual nor problematic as part of "inference to the best explanation" arguments. From this perspective, the *oculus contemplationis* and revelation would be "putative" facts, CUE-facts. Moreover, their discus-



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sion of the specific ways that religious explanations can be good ones hints at the way canonical theism can be defended against the counternarratives that seek to pull the canonical theist back over the threshold of revelation. 

### Notes

<sup>1</sup>B. G. Mitchell, *The Justification of Religious Belief* (New York: Seabury Press, 1973).

<sup>2</sup>Jeremy Waldron, *God, Locke, and Equality: Christian Foundations in Locke's Political Thought* (New York: Cambridge University Press, 2002).

<sup>3</sup>William J. Abraham, *Canon and Criterion in Christian Theology from the Fathers to Feminism* (New York: Oxford University Press, 1998). Abraham distinguishes canonical theism from other manifestations of Christian theism, evangelicalism, classic Protestantism, Roman Catholicism, precisely on this issue of epistemology.

<sup>4</sup>I should note here that in this review, I sometimes use the terms "Christian theism" and "canonical theism" interchangeably. Though the substantive doctrinal differences between canonical theism and other forms of Christian theism are real and important, I am not sure that much hangs on making those distinctions here. What is important is Abraham's suggestion that no particular epistemology has been, or should be, canonized such that it becomes part of the rule of faith.

<sup>5</sup>Abraham contends that both the papal claim to infallibility and the Reformer's attachment to *sola Scriptura* illustrate

attempts to make a particular epistemology definitive for theology.

<sup>6</sup>See Plantinga's seminal "Reason and Belief in God," in *Faith and Rationality: Reason and Belief in God*, ed. Alvin Plantinga and Nicholas Wolterstorff (Notre Dame, IN: University of Notre Dame Press, 1983), 16–93.

<sup>7</sup>For background on the distinction between epistemic methodism and epistemic particularism, see Roderick Chisholm, *The Problem of the Criterion* (Marquette, WI: Marquette University Press, 1973), or the last chapter in his *Theory of Knowledge*, 2d ed. (Englewood Cliffs, NJ: Prentice-Hall, 1977).

<sup>8</sup>Plantinga, "Reason and Belief in God," 74–8.

<sup>9</sup>Richard Swinburne, *The Existence of God* (Oxford: Clarendon, 1979), chapter 13.

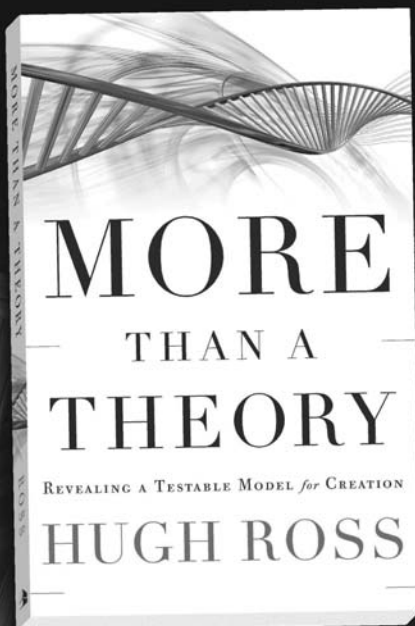
<sup>10</sup>See particularly, Abraham, *Canon and Criterion in Christian Theology*, chapter seven.

<sup>11</sup>See Alasdair MacIntyre, *Whose Justice? Which Rationality?* (Notre Dame, IN: University of Notre Dame Press, 1988).

<sup>12</sup>Over the years, J. R. Lucas has developed the logic of dialectical argument more thoroughly than most others. See J. R. Lucas's on-line book, *Reason and Reality* [<http://users.ox.ac.uk/~jrlucas/reasreal/chap0.pdf>]. Lucas was a particularist before particularism was cool. He criticizes epistemic methodism from a position distinctly different from that of Reformed epistemology, and he draws out, accurately I think, the consequences of epistemic particularism for metaphysics.

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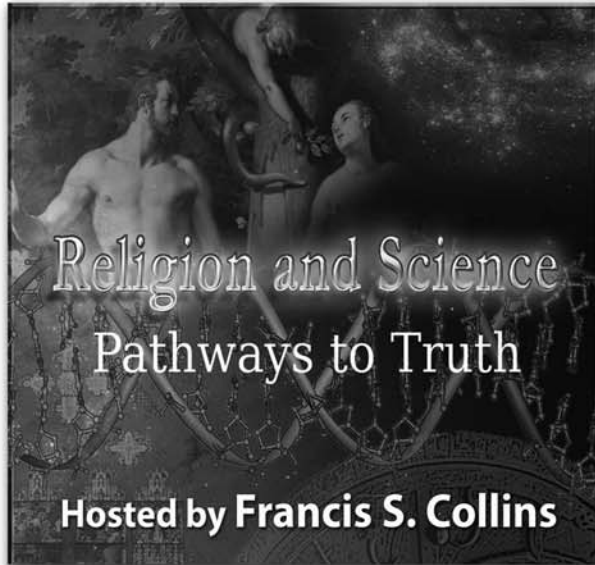
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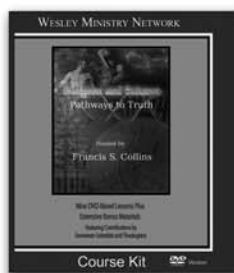


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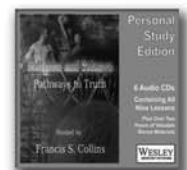


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Bethany Sollereder

## Essay Book Review

# God and Evolution: A Review of Four Contemporary Books

Bethany Sollereder

*Of the four  
books here  
reviewed,  
[I think that]  
Lamoureux's  
and Miller's  
are very  
helpful,  
Giberson's  
is adequately so  
but repetitive  
within the  
field, and  
Dowd's  
is entirely  
off the mark.*

**SAVING DARWIN: How to Be a Christian and Believe in Evolution**  
by Karl W. Giberson. New York: HarperOne, 2008. 248 pages, notes, index.  
Hardcover; \$24.95. ISBN: 0061228788.

**ONLY A THEORY: Evolution and the Battle for America's Soul** by  
Kenneth R. Miller. New York: Viking Adult, 2008. 244 pages, notes, index.  
Hardcover; \$25.95. ISBN: 067001883X.

**THANK GOD FOR EVOLUTION: How the Marriage of Science and  
Religion Will Transform Your Life and Our World** by Michael Dowd.  
New York: Viking Adult, 2008. 413 pages, appendices, index. Hardcover;  
\$24.95. ISBN: 0670020451.

**EVOLUTIONARY CREATION: A Christian Approach to Evolution**  
by Denis O. Lamoureux. Eugene, OR: Wipf and Stock, 2008. 493 pages,  
appendices, notes, glossary, index. Paperback; \$55.00. ISBN: 1556355815.

Over the last ten years, there has been an inundation of books published on the interface between science and religion. With the approach of the one hundred fiftieth anniversary of Darwin's publication of *Origin of Species* in November and his two hundredth birthday in February, the topic of evolution is again being pushed to the forefront of public thought. It deserves to be asked why this topic should be of concern to evangelical readers. After all, people have been finding salva-

tion in Christ for two millennia without needing to have a perfect understanding of the process of origins. Why should readers put time and effort into trying to disentangle this issue?

As a Bible college student in Canada, the evolution debate was completely outside my range of interests. I was not a scientist, and I had no grounds on which to disagree with the science of the evolutionists or of the young-earth creationists. It was not until I was shown that the debate is often fundamentally a hermeneutical issue that I was drawn in. Questions like "What is the nature of the first chapters of Genesis?" and "How does God communicate with his people?" were questions that were applicable to my daily reading of the Bible.

**Bethany Sollereder** received a B.A. in intercultural studies from Vanguard College in Edmonton, Canada, and has spent time on the mission field in both China and Thailand. She is currently working on a Masters in Christian Studies at Regent College in Vancouver, where her studies focus on evolutionary theodicy from an evangelical perspective. She has been an eager participant in the dialogue between science and religion ever since she realized it would allow her to spend more time in Genesis. Bethany is a student associate of the CSCA and she can be contacted by e-mail at: bsollereder@gmail.com



This paper will compare four new books which have been published in the last year: Karl Giberson's *Saving Darwin*, Kenneth Miller's *Only a Theory*, Michael Dowd's *Thank God for Evolution*, and Denis Lamoureux's *Evolutionary Creation*. I will compare and contrast their approaches to the science and religion debate primarily by evaluating their helpfulness to the average Christian who wants to know how the Bible interacts with science, and how to integrate these two disciplines hermeneutically.

## Saving Darwin

Karl Giberson is a professor at Eastern Nazarene College where he teaches the history of science and religion. He holds a doctorate in physics from Rice University. He is the director of the forum on faith and science at Gordon College, and is the co-director of the Venice Summer School on Science and Religion. *Saving Darwin* is his fourth book on the evolution vs. creation controversy.

Giberson's book explodes off the blocks. With a subtitle of "How to Be a Christian and Believe in Evolution" expectations are set very high. In the introduction, Giberson tells the story of how he, as a "teenage fundamentalist" Christian, came to peace with evolution.<sup>1</sup> He also sets forth three provocative theological points. First, he rejects the literal interpretation of the six days of creation.<sup>2</sup> Second, he dismisses the historicity of the Fall of humanity, generalizing it into a basic principle of human nature.<sup>3</sup> Third, he states that we should begin to widen our understanding of what it means to be made in the image of God, extending this label even to other species, such as some of the great apes or, indeed, any species that shows cognitive awareness and altruistic behavior.<sup>4</sup> The way these three points are introduced gives the reader the impression that the book will further explore these issues in relation to the biblical witness and expand on why these three changes should be made. It is a teaser that is never fulfilled. The book is actually a history of evolutionary theory and its acceptance (or lack thereof) in America. These three important conclusions are simply stated in the introduction and then never re-explored, explained, or challenged.

The book begins in earnest with Darwin himself. Giberson weaves his way through the myths and legends surrounding the great scientist, and emerges

with a thoughtful and helpful picture of the man. Neither a hardened atheist vehemently trying to disprove God nor a deathbed convert who recants his life's work at the last moment, Darwin is shown to be a reluctant convert to agnosticism after years of agonizing over the evidence for evolution and the cruelties of nature.

From this starting point, Giberson traces the history of this contentious theory in America. Ellen White and the Seventh-Day Adventists, the monkey-Scopes trial, the writing of Whitcomb and Morris' *The Genesis Flood*, and Phillip Johnson's transformation of creationism into the so-called Intelligent Design (ID) theory all make an appearance.<sup>5</sup> The last two chapters of the book cover some of the arguments against the ID movement and some of the excesses of atheist fundamentalists, like Richard Dawkins, and give an explanation of evolutionary theory. Giberson presents only a brief introduction to each subject, and the overall result is a string of necessarily weak arguments lined up without adequate explanation or proof. The reader is reminded of the theological claims abandoned in the introduction.

It is unclear who the primary audience is meant to be. If the book was written for a popular audience to teach them how to hold evolution and Christianity in balance, it should have dealt with the primary concern of a popular audience: how to read the Bible in a way that can accept the conclusions of science. In Mark Noll's words, "the appeal to Scripture remains the heart of creationism,"<sup>6</sup> and so the antidote to creationism must make a similar appeal. A call to embrace evolution without an accompanying introduction to a new hermeneutic will not help a popular audience. Giberson himself acknowledges that "reflection on the evolution controversy convinces me that the conflict is only tangentially scientific. Those who would adjudicate this dispute by appealing to science are wasting their time."<sup>7</sup> Despite this recognition, he does not once deal with issues of the inerrancy of Scripture or the nature of Genesis. As a result, Giberson loses what could have been a very helpful book for the average layperson.

The book is a fine example of a history of Darwinism<sup>8</sup> in America (of which there are already many<sup>9</sup>), but that hardly accounts for the subtitle. It fails to stand out in the already crowded discussion surrounding science and religion.

# Essay Book Review

## *God and Evolution: A Review of Four Contemporary Books*

### Only a Theory

Kenneth Miller is a biology professor at Brown University. He has written several high school and college level textbooks that are used nationwide, as well as the popular book *Finding Darwin's God* (2000). He testified in the 2004 Atlanta trial concerning his book *Biology*, co-authored with Joseph Levine, and was the opening witness at the September 2005 Dover trial on the teaching of ID theory in public schools.

*Only a Theory* is an incisive exposé of the ID movement.<sup>10</sup> In the first five chapters, Miller presents the case for ID, knocks it down, and then builds a case for evolution. The last three chapters deal with the politics and organization of the ID movement, how scientific theories end up on trial in courtrooms, and musings on the future of science in America.

First, Miller goes through each of the “so-called proofs” of ID theory and discredits them one by one.<sup>11</sup> The disassembly of ID theory is compelling. The mouse trap, the bacterial flagellum, the blood-clotting system, and the immune system are all shown to be reducible and explainable through biological evolution.<sup>12</sup> In addition, new computer programs are demonstrating how simulated natural selection can create information within a replicating and randomly mutating “population.”<sup>13</sup> If one needed more proof, Miller presents a new study where bacteria evolved the capability to metabolize nylon under the direct observation of scientists at Osaka University. Interventionistic Design has never been observed, but evolution and the generation of new information—how to synthesize nylonase—can be recorded in the lab. Miller concludes that “design is an appealing idea only when we *don't* take it seriously”<sup>14</sup> and therefore do not submit it to proper scientific inquiry. Having safely knocked down the ID arguments, Miller builds a case for evolution. The usual suspects are presented: pseudogenes,<sup>15</sup> human chromosome two, and the hominid fossil record.

The second half of the book becomes remarkably more philosophical in tone. Miller reflects on the desire to find purpose in the universe, and links this with the strategy of the ID movement. He muses over the wild success ID theory has met in popular circles and outlines why this seemingly innocent

challenge is, in reality, dangerously undermining the basis of science itself. The crisis caused by the ID movement is shown to be closely related to the relativism that wreaked havoc in the humanities as outlined in Alan Bloom's *The Closing of the American Mind* (1987). The quest for truth is abandoned in favor of a scheme where tolerance is the highest value. As a result, everything becomes relativized. For this to happen in the sciences, Miller argues, it would mean a total redefinition of science. In short, the ID movement theorists and their Wedge document will have achieved their purpose.<sup>16</sup> What is needed instead is for evolutionary science to be divorced from the politics of the day so that it can continue correcting itself through established scientific methods.

The book ends with a rumination on the power of story. The ID movement tells us that life has meaning and purpose—that we were meant to be here and are specially designed for life. How do biological evolutionists respond? Miller powerfully states, “Evolution is not just a better story, a drama with more plot twists and cliffhangers than design could ever imagine, but it has the added advantage of actually being true.”<sup>17</sup>

Overall, *Only a Theory* is a very good book. It makes an important contribution to the current debate by showing how and why the arguments of the ID movement do not stand up to scientific scrutiny. It is written in clear language, interspersed with helpful and amusing anecdotes. The book should appeal to a wide audience.

The science in the book is understandable; the arguments are powerfully written. Simple, memorable examples are given. From the deconstruction of a mouse trap to the genetic reason why we need citrus fruits in our diet,<sup>18</sup> the illustrations are well defined. Miller treats ID theories fairly and debunks them with humor but without scorn. Such a clear-headed, rational approach is increasingly difficult to find in a field dominated by polarizers, such as Ken Ham or Richard Dawkins.

On the other side of the debate, Miller gives a six-page reflection on theological considerations. While this is by no means adequate, his argument starts the reader on the necessary path of trying to determine what kind of literature is contained in the first book of the Bible. Miller's answer is that

"Genesis was written in a prescientific age, in the language of the day and in an attempt to communicate great truths to the people of that age."<sup>19</sup> He goes on to quote both Pope John Paul II and St. Augustine<sup>20</sup> and shows that historical Christianity did not shy away from engaging with new natural knowledge. This brief but helpful section only highlights the desperate need for more work to be done in this area. Miller's introduction to hermeneutical approaches might prod a reader in the right direction, but it does not give the reader a sufficient foundation to address the biblical issues. Nonetheless, this is a fascinating book and is well worth reading.

## Thank God for Evolution

The third author will be less familiar to many evangelical readers. Michael Dowd is a self-acclaimed "evolution evangelist." He has a B.A. in biblical studies from Evangel University (a Pentecostal school), and a Masters of Divinity from Palmer Seminary. He has pastored three different United Church of Christ congregations, and is now a full-time itinerant speaker on what he terms "evolutionary Christianity."

*Thank God for Evolution* is the most disturbing and dangerous of the books reviewed here. The young-earth creationist's fear that acceptance of science causes the loss of true faith is frighteningly realized in this book. Dowd has completely lost touch with even fringe orthodoxy. Yet despite the bizarre and discombobulated hermeneutics and the replacement of the Gospel of Jesus Christ with the "gospel of evolution,"<sup>21</sup> this book has garnered the endorsement of five Nobel Prize laureates. This is a result, no doubt, of the increasing fragmentation of knowledge.<sup>22</sup> A great physicist or physiologist does not necessarily know anything about philosophy or theology, and the support of an economist seems especially irrelevant. Nevertheless, these endorsements hold popular appeal and authority, and orthodox Christians should be ready to answer some of the issues raised by Dowd.

This book is a strange "new-age" brew of personal stories, quasi-hermeneutics, scientific explanations, and self-help practices. Dowd confidently asserts that if you understand the "good news" of our common origins, suddenly you will be able to deal with addictions, unhealthy lifestyle choices,

and personal hurts. He also includes exercises and mantras that can help a person deal with stress and temptations. One almost feels that one has stumbled by accident into an Oprah's Book Club meeting. "The way forward," says Dowd, "begins with this simple truth: *Your greatest difficulties ... while your responsibility, are ultimately not your fault.*"<sup>23</sup>

Dowd divides faith into several different categories. He makes a distinction between "night" and "day" language, that is, between figurative, emotive language and literal, scientific facts. He also makes a distinction between private and public revelation. Private revelation includes all the Scriptures of the world—the Bible, the Koran, the Bhagavad Gita, the Book of Mormon—anything that is not readily available to people worldwide. On the other hand, public revelation includes any scientific discoveries that unequivocally speak of God. Any religious recording from a time when people believed the world was flat, he considers a *flat-earth faith*, written in "night" language. These need to be ushered into the twenty-first century, where they become *evolutionary faiths*, incorporating all the newest "day" language. In doing this, he completely throws out the Scriptures. "Evolutionary religion's alternative to reliance on ancient scriptures is *empirical data*. In a way, the data are our scriptures and to these we submit."<sup>24</sup>

God is also radically redefined. In Dowd's world, God is the greatest of all "holons" or the composite of all parts of creation. God is equated with the sum whole of ultimate reality, and sits somewhere in between pantheism and panentheism. Dowd's new term (he has many) is that he is a crea-THEIST, while his wife, Connie Barlow, who is an atheist, is a cre-ATHEIST. These types of cute and lighthearted approaches quickly become unbearably saccharine.

Possibly the most inappropriate of these changes is the REALizing of biblical narratives. Anything written in a flat-earth faith is to be completely overhauled. So, the idea of original sin and the Fall is simply the cerebellum and neo-cortex asserting themselves against our frontal lobes. We do not sin, we simply are affected by our biological desires to eat, be safe, and reproduce. Yet Dowd maintains that the story of the original Fall is true in that it is an actual "description of the day language process through which our ancestors evolved the frontal lobes."<sup>25</sup> This attempt at concordism,<sup>26</sup> while ignor-



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## *God and Evolution: A Review of Four Contemporary Books*

ing the theological implications of the passage, falls flat. It strips the Genesis account of any truth worth keeping, while still trying to satisfy conservative Christians by relativizing it and declaring it “true.” In the appendices, he does the same with the stories of Christ’s birth, death, and resurrection. The value of their historicity is brushed aside in favor of life lessons that can be learned, such as “pain and suffering can be redemptive.”<sup>27</sup>

The tragedy of this book is that the author came to terms with evolution, but could not find adequate hermeneutics to deal with the Scriptures in a way that did not paint them out of the picture altogether. Instead, he has expended a great amount of energy and effort on an approach which is very attractive to a postmodern audience but has no substance. While we must always allow scientific data as the Book of God’s Works to inform our reading of Scripture, to abandon completely the biblical witness is obviously unacceptable.

### Born Again?

There are a surprising number of similarities between the personal story of Michael Dowd and that of the last author, Denis Lamoureux. Both grew up in Roman Catholic homes and abandoned faith in their early college years. Both joined the army and went on tour to Europe during the same year. Both rediscovered Christ during their army service, and became dedicated young-earth creationists as a result of being entrenched in the science vs. religion dichotomy. Both started to be open to evolution as a result of seminary training. Both wrote their first major book in the area within a year. Dowd espouses evolutionary Christianity, and Lamoureux defends evolutionary creation.

Even more astounding than these similarities are the differences between the two. Dowd has made a decisive break with orthodox theology; Lamoureux is a committed evangelical. Dowd speaks of the gospel of evolution, while Lamoureux continually speaks of the great Savior he has found in Jesus. Dowd has seminary training in theology, and no formal education in science. Lamoureux has earned a Ph.D. in evangelical theology and another Ph.D. in evolutionary biology, adding these to an earlier earned DDS.

### Evolutionary Creation

Denis Lamoureux is currently the associate professor of science and religion at St. Joseph’s College at the University of Alberta. *Evolutionary Creation* is the culmination of nearly twenty-five years of work dedicated exclusively to the evolution vs. creation debate. As a result, his arguments are cogent and powerful.

The book is divided into ten chapters. The first three deal primarily with categorical issues. The next four chapters explore the biblical account of creation, explaining the “science of the day” and showing why concordism with modern science (or as Lamoureux prefers to term it, scientific concordism<sup>28</sup>) is inappropriate. The last three chapters explore issues surrounding human evolution and include Lamoureux’s personal story of coming to terms with evolution.

One of the overall themes in Lamoureux’s work is the issue of concordism. Problems for Christians arise when they attempt to find an accord between the “science” found in Genesis and modern scientific theory. Even a cursory glance will show that the two do not line up well. Instead of throwing out the biblical account, as Dowd does, Lamoureux engages in careful exegesis and uses what he calls the message-incident principle to differentiate between the infallible message of faith and the incidental science of the day. As a result, he avoids the problems that trouble other writers. Fuzzy thinking on these categories often allows subtle forms of concordism to slip in. For example, trying to find some sort of “federal head,” Adam, who can historically represent the human race, or trying to deny the paradisaical state of the Garden of Eden in order to find death before the Fall are attempts to maintain some kind of concordism in the literature while still maintaining the truth of evolutionary biology.<sup>29</sup> Lamoureux rejects this entirely. He writes,

First, Adam never actually existed. Genesis 1 and 2 present the *de novo* creation of the heavens, earth, plants, and animals. This is an ancient origins science with no correspondence to physical reality.<sup>30</sup>

Having said this, he also maintains that Genesis was written with the understanding that it was a real and true account of the origins of humanity. The bridge between these two is the incarnational nature of the Bible.

The question of whether Genesis 1–11 is true is a return to the question asked earlier, “Does God lie in the Bible?” The answer given was an absolute NO! God does not lie, he accommodates. Lying requires *the intention* to deceive. In contrast, accommodation recognizes *the need* to communicate truth in a way that is understandable to an intended audience.<sup>31</sup>

With a hermeneutic that is remarkably similar to that of Peter Enns’s *Inspiration and Incarnation*,<sup>32</sup> Lamoureux compares the biblical account of creation and the flood to other narratives common in the ancient Near East. Understanding the context into which the Holy Spirit was speaking is essential to distinguish the message of faith from the incidental science. Lamoureux also spends a significant amount of time showing the concordist attempts of young-earth creationists and progressive creationists to recreate cosmology in a way that would reflect the biblical narrative. By comparing both sides of the issue, the reader is able to see clearly how the exegeses differ and is left to determine which is the more reasonable.

When it comes to the origin of sin in the world, Lamoureux does not back down. Human sin certainly entered the world as a historical occurrence. At the same time, he rejects the idea of a special, instantaneous creation of the image of God in humans. To clarify his position, Lamoureux compares three different models of origins. Punctiliar monogenism would imagine an historical individual Adam, who in one moment was endowed with spiritual life, and who alone sinned. Punctiliar polygenism is a similar approach, but says that God directly created his image in all existing humans simultaneously, and that all people subsequently fell into sin. Both of these, according to Lamoureux, ultimately belie a *de novo* or ancient understanding of origins. Instead, he advocates a gradual polygenism, a method which says the image of God—that which makes us unique amongst the creation—manifested itself gradually in all humans. Sin also entered the world, but its entrance cannot be pinned down to any one time. The historical emergence of sin and the image of God are veiled within “the category of mystery.”<sup>33</sup> Yet, Lamoureux remains uncompromising about the reality of the sinful state of humanity. The last academic statement in the book is, “Indeed, sin enters the world, but not with Adam.”<sup>34</sup>

Lamoureux uses the analogy of the womb to explain how spiritual realities were manifested gradually and mysteriously during human evolution. “While in our mother’s womb, when do we begin to bear the Image of God? Do we get one-half an Image from her egg cell and the other half from our father’s sperm cell?”<sup>35</sup> So too with sinfulness, the author insists that the emergence of sin, in both the womb and human history, are equally impossible to pinpoint. Instead, the metaphysical realities that are being spoken of cannot be made to fit scientific demands, including the need for a first human pair. This is a radical notion for most evangelicals. Lamoureux really and truly gets rid of a historical Adam and Eve while defending the truth that humans bear God’s image and have fallen into sin. However, most evangelical scholars who accept evolution still feel they must get some sort of historical Adam and Eve into the mix.<sup>36</sup>

Another appealing feature of Lamoureux’s work is that he makes a real attempt at developing an evolutionary theodicy to accompany the new worldview brought to his readers. Using the message-incident principle, he rejects the causal connection of physical death to human sin, and the historicity of the cosmic Fall. At the same time, he absolutely holds to the sinfulness and need for redemption of humanity. Lamoureux also shows the progress of theodicy throughout the Bible. At the beginning of the biblical account, suffering and death are connected to sin; in the New Testament, the suffering and death of Jesus are connected to the divine purpose held for him. This leads to a change of perspective in regards to suffering and death, but it maintains that death was viewed by the original audience of Genesis as a result of sin, even though historically death did not enter the world at the first instance of human sin.

The interweaving of science, Scripture, ancient Near Eastern context, theodicy, and personal story make this book the most comprehensive in dealing with questions raised by the current debate. It is unapologetically scientific and thoroughly evangelical.<sup>37</sup> Most importantly, this book equips the reader to exegete the first chapters of Genesis with confidence, and thus it is highly relevant to all readers who love the Bible and want to read it more carefully. *Evolutionary Creation* is rather imposing at just under four hundred pages, with an additional hundred pages of appendices and indices, but it is well

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worth the time investment and is likely to be one of the most influential books on this topic to emerge this decade.


### Conclusions

The evolution vs. creation debate continues to attract every kind of thinker and speaker. From the absolutely absurd to the incredibly cogent, from amateurs to the embarrassingly well educated, young and old, everyone is represented. Every walk of life contributes as well—scientists, theologians, historians, lawyers, and so forth. Increasingly, the challenge is to sift through all the repetitive or unhelpful materials being produced to find those contributions that really move the discussion forward. Of the four books here reviewed, Lamoureux's and Miller's are very helpful, Giberson's is adequately so but repetitive within the field, and Dowd's is entirely off the mark. Only Dowd and Lamoureux deal with the hermeneutical issues at length, and of these two, only Lamoureux maintains an orthodox position.

Personally, the evolution vs. creation debate was never the watershed issue of biblical inerrancy for me that it was for an older generation. I attended a small, Bible belt, Pentecostal Bible College, much like Dowd did. I also attend Regent College, where Lamoureux did some of his graduate work. But times have changed since they attended. While Vanguard (Pentecostal) College did not necessarily endorse evolution, it was not against it either. At Regent, the conversation is still alive and well, but it consists mostly of evolutionary creationists trying to convince the last remnant of young-earth creationists, rather than the other way around.

Generation Y generally has no problem with evolution. After all, the evidence has become so overwhelming in recent years that it is becoming impossible to contradict. The real danger now is that the youth and young adults are more likely to accept science and reject Christianity if the two come head to head. How many of my generation have to abandon belief before we, as Christian scholars, finally relinquish our deep-seated need for concordism? The irony is that it is often the same people who know the text the best who are also the most entrenched in concordist beliefs. The time has come, however, for us to come to terms with evolution and the nature of biblical revelation. If we do

not, Christianity as a whole will be seriously compromised in the minds of the next generation, especially for those outside the faith community. The pastoral implications of this misguided debate are immense.

The recent brouhaha over the resignation of Michael Reiss from the Royal Society after the misinterpretation of his comments has shown just how sensitive even the global, secular world has become to the topic of creationism.<sup>38</sup> It has become a time when we as Christians must choose our words and approaches with care. To have our "conversation be always full of grace" (Col. 4:6) while "speaking the truth in love" (Eph. 4:15) is becoming ever more necessary. 

### Notes

<sup>1</sup>Karl Giberson, *Saving Darwin: How to Be a Christian and Believe in Evolution* (New York: HarperOne, 2008), 3.

<sup>2</sup>*Ibid.*, 9.

<sup>3</sup>*Ibid.*, 12.

<sup>4</sup>*Ibid.*, 13–4.

<sup>5</sup>There is a great difference between the Intelligent Design theory and the historical Christian understanding of intelligent design. The ID movement is really an *interventionistic design theory* which holds that God must intervene in order to assemble biological systems, in one fell swoop, that seem too complex to develop through an evolutionary process, such as the blood clotting system. The traditional Christian understanding of intelligent design holds that God reveals himself and his eternal qualities through the created world, and has nothing to do with the support or denial of natural processes (See Rom. 1:19–20).

<sup>6</sup>Mark Noll, *The Scandal of the Evangelical Mind* (Grand Rapids, MI: Eerdmans, 1994), 200.

<sup>7</sup>Giberson, *Saving Darwin*, 166.

<sup>8</sup>By this I mean Darwin's theory of evolution through natural selection and gradual phylogenetic change. *Darwinism* is a problematic term since it is often skewed to carry metaphysical implications of atheism or of a dysteleological universe—notions to which Darwin never ascribed. Nor is the term *Darwinism* used in scientific literature. It is replaced by either "biological evolution" or left simply as "evolution."

<sup>9</sup>For example, the work of Edward J. Larson in this area is very comprehensive. See *Evolution: The Remarkable History of a Scientific Theory* (New York: Random House Publishing Group, 2006); *Trial and Error* (New York: Oxford University Press, 2003); or *Summer for the Gods: The Scopes Trial and America's Continuing Debate over Science and Religion* (New York: Basic Books, 2006); see also Ronald L. Numbers, *Darwinism Comes to America* (Cambridge, MA: Harvard University Press, 1998) and his *The Creationists: The Evolution of Scientific Creationism* (Berkeley, CA: University of California Press, 1993).



<sup>10</sup>Kenneth R. Miller, *Only a Theory: Evolution and the Battle for America's Soul* (New York: Viking Adult, 2008).

<sup>11</sup>Miller, it should be said, believes in intelligent design while rejecting the ID theory:

The notion that the universe has a rationality, an architecture that reflects the work of a creator is an old and traditional one in western thought ... Investigating the workings of nature, as well as its history, was viewed as a way of exploring the plan, purpose, and "design" of nature's creator. Seen in this way, the process of biological evolution is nothing more than an attempt to understand how the natural world produces the range and diversity of life all around us. In short, evolution is another way to appreciate the intelligence reflected in the ultimate design of nature.

In regards to the ID movement, Miller states,

Ironically, their creationist views actually lead them to regard nature as insufficient to account for the origin of species. This means, in a theological sense, that they see nature not as the logical work of a wise and provident creator, but as insufficient, incomplete, and deeply flawed.

Kenneth R. Miller, personal communication, October 23, 2008. See note 5 above.

<sup>12</sup>Each of these arguments are ultimately different versions of the God of the gaps theory. They attempt to show where interventionistic rather than providential divine action should be seen. Unfortunately, like the retrograde motion of the planets in Copernicus' day, a greater understanding of the world around us begins to close those gaps, making God seem a rather idle or redundant figure.

<sup>13</sup>Of course, it could be argued that there is still an ultimate intelligent designer behind these programs, namely the programmer who gives parameters to the random generations.

<sup>14</sup>Miller, *Only a Theory*, 86.

<sup>15</sup>A pseudogene is a gene that is unable to be translated into a protein due to a mutation to its structure. This can happen in several ways. A nonsynonymous mutation, premature stop codon, or a transposition could all be causes of a pseudogene. The classic example in humans is the Vitamin C pseudogene, where the vestiges of code to synthesize vitamin C remain in our DNA, yet are non-functioning and so force us to add citrus fruits or other sources of ascorbic acid to our diet.

<sup>16</sup>For the Discovery Institute's response to the uproar surrounding the Wedge document, as well as the document's full text, visit [www.discovery.org/a/2101](http://www.discovery.org/a/2101)

<sup>17</sup>Miller, *Only a Theory*, 220.

<sup>18</sup>See endnote 15 above.

<sup>19</sup>Miller, *Only a Theory*, 159.

<sup>20</sup>While this oft-used quotation beginning with "Usually, even a non-Christian knows something about the earth ..." is thought to show that Augustine did not look for harmonization between the Bible and science, this is not always the case. Later, in the same book, he speaks of Ps. 104:2 and Isa. 40:22, and states,

But if it is necessary, as it surely is, to interpret these two passages so that they are shown not to be contradictory but to be reconcilable, it is also necessary that both of these passages should not contradict the theories that may be supported by true evidence (p. 59).

In reference to the firmament he also says,

They must certainly bear in mind that the term "firmament" does not compel us to imagine a stationary heaven: we may understand this name as given to indicate not that it is motionless but that it is solid and that it constitutes an impassable boundary between the waters above and the waters below (p. 61).

Augustine did not accept science as valid in its own right, in that he would not accept a "scientific" fact if he could not also reconcile it with the biblical account. St. Augustine, *The Literal Meaning of Genesis 1*, in *Ancient Christian Writers* 41, trans. John Hammond Taylor (Mahwah, NJ: Newman Press, 1982).

<sup>21</sup>Michael Dowd, *Thank God for Evolution: How the Marriage of Science and Religion Will Transform Your Life and Our World* (New York: Viking Adult, 2008), 49.

<sup>22</sup>This is exactly the problem Ian Barbour points out in *Religion in an Age of Science* (San Francisco, CA: Harper, 1990). "The whole controversy reflects the shortcomings of fragmented and specialized higher education" (p. 10) and "Scientists are no wiser than anyone else when they step out of their laboratories and speculate beyond strictly scientific work" (p. 14).

<sup>23</sup>Dowd, *Thank God*, 15. Italics original.

<sup>24</sup>*Ibid.*, 77.

<sup>25</sup>*Ibid.*, 167.

<sup>26</sup>"Concordism" is the attempt to find an agreement between two different groups or disciplines. See endnote 28.

<sup>27</sup>Dowd, *Thank God*, 366.

<sup>28</sup>Scientific concordism attempts to find agreement between the biblical record and scientific data discovered today. Historical concordism is the attempt to line up archeological and historical studies with the biblical histories.

<sup>29</sup>This is the case in Denis Alexander's new book *Creation or Evolution: Do We Have to Choose?* (Oxford: Monarch Books, 2008). Alexander presents five models for how Adam and Eve could have existed, but favors a model of federal headship in which either two people or a community of Neolithic farmers in the Middle East became "*homo divinus* who were truly spiritually alive in fellowship with God, providing the spiritual roots of the Jewish faith" (p. 237). His concordism is evident when comparing this model to a view similar to Lamoureux's where Alexander says, "Such a retelling of earlier events in theological terms is by no means impossible, but does empty that retelling of any Near Eastern context and detaches the account from its Jewish roots" (p. 240). By placing "Adam and Eve" in the Middle East, instead of Africa or Australia, Alexander can achieve an accord between the biblical text and the actual history of the dispersion of *homo sapiens* around the globe.

<sup>30</sup>Denis O. Lamoureux, *Evolutionary Creation: A Christian Approach to Evolution* (Eugene, OR: Wipf and Stock Publishers, 2008), 319.

<sup>31</sup>*Ibid.*, 269–70. Italics original.

<sup>32</sup>Lamoureux found Enns's work outstanding, and was sad to hear of his being fired at Westminster Theological Seminary. The major turning points in Lamoureux's hermeneutical journey, however, came over several years. The first was at Regent College, reading George Ladd's *The New Testament and Criticism* (Grand Rapids, MI: Eerdmans, 1966) where Ladd says, "It is the central thesis of this book that *the Bible is the Word of God given in the*

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words of men in history" (p. 12). A second turning point occurred in 1988 when Clark Pinnock lectured at Wycliffe College on his book *The Scriptural Principle* (1984). It was here that he first discovered an incarnational approach to Scripture. Denis Lamoureux, personal communication, October 1, 2008.

<sup>33</sup>Lamoureux, *Evolutionary Creation*, 288.

<sup>34</sup>Ibid., 329.

<sup>35</sup>Ibid., 287.

<sup>36</sup>Keith Miller's *Perspectives on an Evolving Creation* (Grand Rapids, MI: Eerdmans, 2003) gives several different views on Adam and Eve. James Hurd's article in the compendium, "Hominids in the Garden," presents the difficulty of an *ex nihilo* view scripturally, yet he still attempts to "harmonize the paleontological record with the biblical account" (p. 224), once again showing the deep-seated concordism that is causing the problems. This ends up tacking an Adam and Eve on the tail end of evolutionary processes simply to try "to have one's cake and eat it too." For more examples, see Darrell Falk, *Coming to Peace with Science* (Downers Grove, IL: InterVarsity Press, 2004) where in the last pages of the book he says it "certainly is still possible that Adam and Eve were real individuals who lived in real

time" (p. 226), but also "an alternative view is that God inspired the picture of Adam, Eve and the garden in story form" (p. 227). Bruce Waltke's new book *An Old Testament Theology* (Grand Rapids, MI: Zondervan, 2007) supports the idea of "theistic evolution," but demands that God "by direct creation made 'ādām a spiritual being" (p. 203). This seems to be as far as scholarship goes in an evangelical context, which makes Lamoureux's insistence on relinquishing historical concordism refreshing.

<sup>37</sup>Lamoureux's concern for including the Bible in his work is evident from the scripture index which covers twelve pages.

<sup>38</sup>Michael Reiss, a former director of education for the Royal Society, stepped down from his position as a result of misinterpretations regarding comments on creationism. Reiss felt that science teachers should take the time to explain why creationism is not a valid scientific theory. Many took this to mean he was advocating the teaching of creationism in Britain's science classrooms. Ian Sample, "Professor Steps Down over Creationism Row," *The Guardian*, 17 September 2008 [newspaper on-line]; available from [www.guardian.co.uk/theguardian/2008/sep/17/mainsection/uknews](http://www.guardian.co.uk/theguardian/2008/sep/17/mainsection/uknews); Internet; accessed 4 October 2008.

pour déterminer à quelle partie de la Terre  
Ces Régions sont les Terres Arctiques du  
Antarctiques du côté du Sud.

TERRES ARCTIQUES

Ces Terres ont été découvertes par les  
les Anglois et les Russes qui cherchoient  
pour aller d'un continent à l'autre; mais  
dans leur projet. Ces nouvelles Terres  
Le Groenland qui est entre les deux  
deux. L'Arctique découvert dans le nouveau  
globe. Le Nouveau découvert sur la fe  
par les Danois; Ce dernier abonde en po  
Castor en Renne, en Chaux, en grise et  
Ne voit pas ces côtes ces rochers de Balte  
Danois, les Hollandais et quelques Fra  
faire une pêche considérable de ces Ba

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## ENVIRONMENT

**CHRISTIANS, THE CARE OF CREATION, AND GLOBAL CLIMATE CHANGE** by Lindy Scott, ed. Eugene, OR: Pickwick Publications, 2008. 144 pages, index. Paperback; \$17.00. ISBN: 9781556358449.

This short book edited by Lindy Scott explores global climate change from a variety of angles. Part One consists of papers presented at a 2006 panel discussion on climate change held at Wheaton College. Since these first chapters were originally oral presentations, they contain a bit of overlap. Still, each of these early chapters coherently presents the evidence for climate change and discusses present and future implications. As such, the first half of the book serves as a good primer for anyone interested in the discussion.

Chapter one was written by Wheaton President A. Duane Litfin. This chapter introduces the panel and explains why Litfin signed the Evangelical Climate Initiative statement, "Climate Change: An Evangelical Call to Action." In chapter two, physicist Douglas Allen defines the terms used to discuss climate change and explains the data that correspond with this climate change. The next two chapters respectively address the intersection between climate change and global health, and economics. The final chapter of this section, "Climate Change: Global Problem, Global Solutions" by Noah J. Toly, reiterates some of the arguments of the previous chapters, but also offers some hope that changes in human behavior can alter the trajectory of global climate change.

Part Two uses Wheaton College as a case study for a Christian response to global climate change. Whereas the first half of the book presents data, this half offers the personal. As a collection of personal reflections and essays, this section is unevenly written. Many of these authors appear to favor lists, and they write with an overly informal style. Still, this section offers some tangible examples of how to think through energy use issues and how to implement changes. For this reason, this section of the book can serve as a useful sourcebook for Christian schools and institutions that likewise wish to concretely respond to global change as part of their concern for creation care.

*Reviewed by Rebecca J. Flietstra, Professor of Biology, Point Loma Nazarene University, San Diego, CA 92106.*



## ETHICS

**THEOLOGY, DISABILITY AND THE NEW GENETICS: Why Science Needs the Church** by John Swinton and Brian Brock, eds. New York: T&T Clark/Continuum Books, 2007. 251 pages, index. Paperback; \$41.95. ISBN: 9780567045584.

**THEOLOGY AND DOWN SYNDROME: Reimagining Disability in Late Modernity** by Amos Yong. Waco, TX: Baylor University Press, 2007. 450 pages, scripture, author, subject indices. Paperback; \$39.95. ISBN: 9781602580060.

Officially, prenatal genetic testing is offered in standard medical care to enhance preparation and choice. In practice, what is generally available from prenatal genetic testing is abortion to prevent the birth of children with disabilities, most often with Down's syndrome. Once a diagnosis of Down's is established, abortion follows in the countries of Europe and North America at rates reported from 67% to 98%.

The writers of the Swinton and Brock anthology are agreed that this is a travesty for at least three reasons. First, by the time a diagnosis of Down's is made, a fellow human being is already with us and should be welcomed. This concern hinges on when one recognizes that there is a neighbor present in the womb to love. If the one diagnosed in the womb with Down's is a fellow human being, protection and nurture should follow as much as for people at any other age. Since the diagnosis is usually not available until several months into pregnancy, most of the authors of the anthology hold that a child is already present at the time of diagnosis and should be welcomed whatever his or her condition.

A second prominent theme in the anthology is that aborting Down's pregnancies disparages those who live with Down's. This argument is quite right to take seriously how people perceive themselves and long-term societal momentum. However, taking vitamin B12 during pregnancy to avoid spina bifida does not belittle or reject people who have spina bifida. People are embodied, but are also more than their bodies. Most can distinguish that they are more than a condition that affects them. Avoiding a condition does not say that those who still deal with it are thereby worth less. The power of this argument depends on the previous one as to whether one is using abortion to avoid a disability or to kill someone with a disability.

A third central theme is that God has a purpose in people being born with Down's. When they are not, the world is poorer. This concern builds from an Augustinian view of providence, that God ordains even the darkest threads of our lives to play a role in the greater picture we do not yet see. But even if Augustine is right that God chooses to control everything, could not God also choose to send deliverance? Jesus healed the man born blind (John 9:1-7).

This raises a theological issue that is particularly sensitive for Amos Yong's tradition. For many Pentecostals, continuing disability or illness tracks back to sin or lack of faith. Yong argues to the contrary, that his own brother with Down's is part of God's plan for a diverse human community. Waters argues in parallel in the Swinton volume, "May not the scholar disabled by critical cynicism, for instance, be graced by the gift of simplicity offered him by the Down's syndrome person?" For Waters, as for Yong, Down's is part of the different gifting God has designed for the edification of the church. Yong argues for this perspective from the full range of disability literature and from biblical texts. For example, he sees Jacob's limp as a disability that is a testimony to Jacob's walk with God. Yong acknowledges that seeing Down's as God's design for now and in heaven is a novel approach; he directs half of his book to the implications of such a conviction for a wide range of systematic theology. He develops in particular what he calls an emergentist/



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relational anthropology, a pneumatological ecclesiology, and a holistic soteriology.

Brock as an editor of one volume and Yong as the sole author of the other, enrich their books with poignant accounts of each having a family member with Down's syndrome. Yong in particular begins every chapter with the experiences and words of both his brother Mark and others with Down's. This allows the authors to make vivid the importance of welcoming, enjoying, learning from, and working with our brothers and sisters in the faith who have Down's syndrome. In that important call, both books are perceptive contributions. As noted above, the success of further claims depends on where one stands on some of the most basic of theological convictions.

*Reviewed by James C. Peterson, R. A. Hope Professor of Theology, Ethics, and Worldview, McMaster University Divinity College and Faculty of Health Sciences, Hamilton, ON L8S 4K1.*



### GENERAL SCIENCES

**QUANTUM SHIFT IN THE GLOBAL BRAIN: How the New Scientific Reality Can Change Us and Our World** by Ervin Laszlo. Rochester, VT: Inner Traditions, 2008. 184 pages. Paperback; \$14.95. ISBN: 9781594772337.

Whenever I read a book written by a Nobel prize nominee (peace, in this case, twice), I expect an interesting read. *Quantum Shift in the Global Brain* did not disappoint, but for rather a surprising reason: the book is a strange juxtaposition of societal and global trends, quantum and chaos physics, and pseudoscience, with wide breadth and bold claims. So it kept me on my toes. It would be difficult to portray the breadth of such a broad sweep of knowledge, and likewise, virtually impossible to portray all the controversies that actually lie behind many of the claims that are taken as simple fact in this volume.

The book is in three parts. The first consists of a succession of eight rather brief chapters. The first couple of these discuss many of the challenges that we face as humans in terms of sustainability, as seen by Laszlo. He predictably warns against such concerns as manmade climate change and a menagerie of political, economic, and ecological problems, and also makes some good points in criticizing the modernist mechanistic mentality, or "business as usual" (p. 9), a civilization he portrays as a "culture of *Logos*." Here he also begins to pick up on the theme of world unity and his idea of the coming "macro-shift," in which he refers to chaos theory (non-linear dynamics) as a potential source of that shift. Taking some license with this whole field of science—and assuming that evolution is best described by nonlinear dynamics (p. 20), a controversial subject at best—he outlines phases of a nonlinear process for the evolution of society: after our own societal structures such as our economic and financial systems (the "roots of unsustainability," p. 39) cause instability, then comes a "run-away" situation that gives rise to a point of bifurcation of society's evolutionary trajectory, leading either to breakdown or to breakthrough (p. 19). The breakthrough is to be governed by such things as "more effective information use" and "higher organization levels" (p. 28). Finally, we reach

chapter five, called "A New Vision" (p. 51) in which he first debunks a number of "outdated beliefs" and "dangerous myths," many of which we Christians would also be uncomfortable with, e.g., "technology is the answer" and "new is always better" (p. 53), or "the more you consume the better you are" (p. 58). In place of these, he offers a new ethical code, which he calls a "planetary ethic" (p. 63), complete with his own "ten commandments" (pp. 61–2), starting from an ecological globalism. The major idea is to "*act so as to further the ongoing evolution of the biosphere*" (p. 71, italics his). He clearly has in mind here that we are to actively take on the next chapter of evolution and forge our own future. The end result is to replace the culture of *Logos* with a "culture of *Holos*," the title of chapter 7.

Part Two addresses the question, how is this culture of *Holos* to be realized? The answer is, by harnessing the quantum world of coherence in our minds. While it is true that experiments in quantum mechanics yield astounding results in nonlocal coherence (usually called entanglement), Laszlo takes these results far beyond the laboratory. His claims are reminiscent of the movie *What the Bleep Do We Know?* a movie that, like Laszlo, suggests that quantum mechanics demonstrates an interconnected world of consciousness for all humanity, and hence, a "quantum shift in the global brain." The difference is that Laszlo expands the ideas, wrapping them in a new pseudoscientific jargon, sprinkling legitimate science in between his own interpretations of speculative claims which he asserts as facts, but often without references. This is typical pseudoscience fare.

In view of the quantum coherence experiments, Laszlo postulates a coherence in the domain of all brain and mind, and then postulates an "akashic field" or "A-field" (p. 108) in the "cosmic plenum" (p. 88), which is supposed to be the interconnecting field of all nature, and of all minds. (By "cosmic plenum," he means the quantum vacuum, although he does not like the connotations of that term, p. 92.) He then offers us a "new metaphysics" (two domains, the spacetime domain and the domain of "cosmic plenum," p. 113), a "new theology" ("God is part of the universe. God's creation is not the universe we observe and inhabit itself but the *potentials* of the universe for its *self-creation*," p. 116, italics his), and a "new morality" ("moral action contributes to the coherence of the subject and the world around the subject," p. 118). It is hard to relate how implausible most of what he says in this section sounds to a physicist. For example, he apparently thinks it makes perfect sense to say "[o]ur wave fronts propagate in the A-field of the plenum and interfere with the wave fronts created by the bodies and brains of other people. The resulting interference patterns are natural holograms ..." (p. 124), and these propagate "most likely" by longitudinal "scalar [electromagnetic] waves," which "carry information but not energy" (p. 165), a nonsensical concept to most physicists. According to this "theory," generations leave their "holographic traces" in the A-field and the collective of all holograms is the "collective information pool of humankind" (p. 124). He ends the section with "[t]he quantum shift in the global brain is humanity's best chance" by which he means a heightened level of "transpersonal consciousness" (p. 125) through the A-field. This he relates to various forms of traditional religious "enlightenment" along the way.

Most of the last section is spent describing efforts by various organizations which are set up for pursuing Laszlo's program, such as "The Club of Budapest" and the "WorldShift University." However, the final chapter is strikingly different: a rather lengthy discussion comparatively (20 pages) concerning communication with the dead through various old electronic devices (e.g., tube radios) which are explained through, you guessed it, the A-field holograms. This chapter was perhaps the most fun read of the entire book, although I found myself constantly asking, "What is really going on?" Although they mentioned several scientists who attested to the phenomena, I was reminded of reading somewhere that if you really want to get to the bottom of something like that, you need a magician; scientists are too easily fooled.

In summary, Laszlo portrays a wonderfully attractive vision of some sort of utopia that is to emerge after a rather chaotic upheaval in our cultural experience. But this vision, while "spiritual" in some sense, is far from Christian, with no sin, no savior, and the only salvation is in the peace and harmony that his "akashic field" is supposed to provide.

Who would want to read this book? There may be some readers of this journal who might be interested in it: those interested in keeping up with "new age" moves, those who enjoy debunking claims of pseudoscience, people interested in globalization and the various efforts on that front, and people interested in spirituality studies. However, because this is not a book to which one would turn to learn science, nor is it a book that in any way seriously engages Christianity, I do not imagine that the book would be of major interest to most readers of *PSCF*.

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## HEALTH & MEDICINE

**CONSCIOUSNESS, SELF-CONSCIOUSNESS, AND THE SCIENCE OF BEING HUMAN** by Simeon Locke. Westport, CT: Praeger, 2008. 172 pages. Hardcover; \$34.95. ISBN: 9780313350061.

With a few notable exceptions, the study of consciousness during the twentieth century was almost exclusively under the domain of philosophers and theologians. Those who were professionally aligned as behavioral or natural scientists were actively discouraged from investing any intellectual stock in this elusive topic. Fortunately, a subtle paradigm shift has opened the door for scholars from a variety of disciplines to weigh in on this fascinating subject. Within the past fifteen years, there has been a plethora of scholarship involving hundreds of published articles in referred journals and dozens of books. Simeon Locke's book *Consciousness, Self-Consciousness, and the Science of Being Human* is a welcome addition to the recent collection.

There is much to appreciate about Locke's attempt to define and contextualize consciousness. Part of the uniqueness of this book resides in Locke's own training and subsequent distinguished career in the field of neu-

rology. Locke takes a physicalist, as opposed to a philosophical, approach to the study of consciousness. This aligns him more with the recent writings of scientists such as Hobson, Crick, Koch, and Damasio. Not only does Locke see consciousness (which includes at least three levels) as solely arising from brain states, but he goes even further than most authors to try to associate different aspects of consciousness, or self-consciousness, to specific structures and functions of the central nervous system. He is clearly interested in theorizing that which fits with our current understanding of biological plausibility.

Another characteristic that sets this book apart from others is its brevity. It is one of the shortest books I have read on the topic. The book, not including references and end-of-chapter notes, comes in at 122 pages. The book contains seventeen chapters, most of which are fewer than five pages in length. Yet Locke's prose is transparent and terse—he gets right to the point, and time is not wasted on irrelevant diversions.

Locke defines consciousness as "the state of an organism able to respond at a cerebral level to stimuli from the environment" (p. 6). Several comments are in order concerning this definition. First, Locke wants to confine the definition of consciousness to a state of preparedness or readiness to respond. This clearly implies that consciousness is not a "thing" that occupies a particular location in the brain. Essentially, consciousness is viewed as a function. This particular view appears to be adopted from William James who wrote about it more than one hundred years ago. Second, this definition does not make consciousness the sole property of humans. Third, Locke is convinced that the concept of awareness is an altogether separate phenomenon and should not be linked with consciousness. If an organism is aware of being aware, then, in Locke's view, the organism is displaying self-consciousness.

An additional contribution to Locke's theorizing resides in how he sees the "function" of consciousness emerge. Consciousness is an emergent property, not from a cell or a collection of cells, but as a process or function of a system which is composed of interchangeable parts. The concept of interchangeable parts is unique. It allows for a system to maintain a "generalized" consciousness even under conditions in which functional parts of the system are compromised. This could help explain why we have not located consciousness in any one particular area of the brain.

Locke's book does have its flaws. While he introduces various subtopics from the fourth chapter onward—such as attention, sleep, representation, vision, and volition—the discussion is too brief to allow one to get into the more substantive issues and questions. In addition, Locke has a challenging writing style, both in terms of how the language flows and in its clarity.

Overall, I recommend this book for graduate students and members of the academy who want to add some fresh ideas to their existing study of consciousness from a neurobiologically informed perspective.

*Reviewed by Bryan C. Audey, Professor of Psychology, Gordon College, Wenham, MA 01984.*



## HISTORY OF SCIENCE

**SCIENCE AND SCIENTISM IN NINETEENTH-CENTURY EUROPE** by Richard G. Olson. Urbana, IL: University of Illinois, 2008. 368 pages. Paperback; \$27.00. ISBN: 9780252074332.

In *Science Deified and Science Defiled* (2 volumes, University of California Press, 1991, 1995), Richard G. Olson explored “the historical significance of science in Western culture from the early modern age through the early romantic.” In this volume, he continues the historical survey through the nineteenth century, in the process analyzing an amazing array of intellectual and social movements including, among others, the post-revolution French ideologues, Saint-Simonist socialism, positivism, *Naturphilosophie*, romanticism, and social Darwinism.

Olson, who is professor of history and the Willard W. Keith Jr. Fellow in Humanities at Harvey Mudd College, integrates these separate stories into a coherent narrative by employing the lens of “scientism,” which he defines in a nonpejorative sense, contra Hayek and others. Olson’s stated goal is “neither to applaud nor condemn the attempts of nineteenth-century thinkers to bring methods, concepts, practices, and attitudes from the investigation of the natural world to bear on human activities and institutions” (p. 3). For the most part, he succeeds. His portrayals of competing or quarreling parties, movements, and ideologies are even-handed, frequently sympathetic. There is no axe to grind.

This dispassionate approach is for Olson not merely a convenient tactic that permits him to address diverse movements and views without subjecting them to continual critique and evaluation; it is also a reflection of his understanding of the pluralism of scientific orthodoxies today. He argues that “there are many different sciences and many different scientific practices, or rationalities, each of which functions in our culture to affect the views of different groups of people for different purposes” (p. 5). This is an explicitly postmodern approach to science, reminiscent of Alasdair MacIntyre’s critique of competing rationalities (*Whose Justice? Which Rationality?* University of Notre Dame, 1989).

Olson explicitly characterizes science as a “cultural institution” that, while “aimed at contributing to an organized, universally valid, and testable body of knowledge about phenomena” (p. 2), does not necessarily produce what it seeks to do. Nor does Christianity, he notes. Olson’s last book, *Science and Religion, 1450–1900* (Johns Hopkins, 2006), employed the same broad survey approach to cover the familiar terrain of the interplay between scientific and religious thought during these formative centuries. There he again rejected the dominant paradigm of the literature (in this case, that of confrontation), finding instead a frequently positive, surprisingly diverse, and occasionally mutually supportive relationship between these two cultural movements. Olson approaches both science and religion as cultural expressions that are created, understood, and utilized by their practitioners for a variety of purposes.

And he is interested in those purposes. In this volume he understands scientism very broadly, as any social, intellectual, or cultural movement that claimed or endeavored to situate itself as somehow “scientific” and regarded itself therefore as superior in process or content from those to which it stood in opposition. This broad definition obviously includes the early socialism of Henri Saint-Simon, because “given their understanding of the historical and future goals and characteristics of science, the Saint-Simonians unquestionably understood themselves as scientists” (p. 59), a claim that Frederick Engels and the aforementioned F. A. Hayek both derided.

But it also includes some unexpected characters, such as the higher criticism school of German biblical scholarship (e.g., David Strauss, Ludwig Feuerbach, etc.). Regarding the latter group, Olson strays from his topic for just a moment to speculate on the reasons that various European intellectuals found themselves pulling away from or attempting to reshape orthodox Christianity. Instead of rooting this loss of faith in the rise of public science, he argues instead that “interest in science, by itself, rarely if ever seems to have initiated religious crises. More frequently religious crises led to a search for alternative sources of value, which often ended in some form of scientific position, either secular or religious” (p. 185).

Olson’s survey is organized both chronologically and geographically. He begins in France, arguing that “early nineteenth-century scientisms were principally reactions against scientifically grounded social theories that had been developed during the seventeenth and eighteenth centuries and that seemed to be implicated in the origins of the French Revolution” (p. 11). Part One thus includes chapters on *Ideology*, on Saint-Simon and socialism, and on August Comte and positivism, all of which arose in the decades following the Revolution and attempted to supplant some of its assumptions.

Part Two moves first to Germany and then to Britain. It begins with a chapter on *Naturphilosophie* (a fascinating discussion of a scientific method quite different than that which has become dominant in the century and a half since), another on competing materialistic philosophies and the reshaping of religious thought among intellectuals, and a third on public science in the early Victorian period.

Part Three is less geographical and focuses on the particular impact of evolutionary thought in the nineteenth century, exploring pre-Darwinian views, Darwinian evolution (a popular topic these days given Darwin’s two-hundredth birthday in February and the sesquicentennial of the publication of *Origin of Species*), and, of course, Social Darwinism, perhaps the most readily recognizable scientism of this century.

Part Four consists of a shorter (one-chapter) discussion of “the problem of degeneration” in the late nineteenth century. Perceived physical, moral, or social degeneration served as the moral and intellectual opposite of the optimism of most scientific and scientific thinking of the nineteenth century, and was often linked to the second law of thermodynamics. It thus served as fodder for much early twentieth-century thought, particularly post-World War I.



Unlike most historians, who work within the framework of a “long” nineteenth century, stretching from the outbreak of the French Revolution in 1789 to the outbreak of World War I in 1914, Olson ends his survey in the 1890s, as he observes a shift in the thinking of the intellectuals who came into their prime during that decade (e.g., Nietzsche, Freud, Weber, Croce, and Mach) away from the more simple scientisms of the earlier decades to a more complex, less optimistic understanding of the potential of both science and human society. He also perceives a shift in the center of such thought, away from Europe to the United States, occurring during this decade.

Any work of such scope, compressed into so few pages, can be criticized for what it includes and what it does not. Recognizing that the dominant intellectual currents of the nineteenth century were largely in northern, Protestant or secular Europe, I was nonetheless disappointed that there was largely no mention of southern or eastern Europe, and find myself wondering if the Catholicism or Orthodoxy of those regions inhibited or invalidated appeals to science as the basis for social or intellectual movements that would be classified as scientific. Nevertheless, such questions of inclusion/exclusion are overly picky. This is very good intellectual history: broad enough to make intriguing connections, deep enough to learn something new, short enough to be absorbed in a single volume, and readable enough for the educated nonspecialist to enjoy. And, if Olson is correct, it may even be helpful in understanding the scientisms of our day, rooted as many are in the methodologies and assumptions of the nineteenth century.

*Reviewed by Anthony L. (Tony) Blair, Associate Professor of Leadership Studies, Eastern University, St. Davids, PA 19087.*



## ORIGINS & COSMOLOGY

**THE GOD WHO MAKES THINGS HAPPEN** by Samuel A. Elder. Lincoln, NE: iUniverse, Inc., 2007. x + 134 pages. Paperback; \$14.95. ISBN: 9780595422364.

Samuel Elder is a Fellow of the Acoustical Society of America, author of textbooks and numerous journal articles, has taught both college level Bible and physics courses, and currently lives in Annapolis, Maryland. The present book is an exploration of the impact of modern physics on interpreting the Genesis account of creation. Before getting into the specifics of the text, a few things need to be mentioned. For example, this title assumes that spiritual and physical realities are compatible with one another, and even necessitate one another. Additionally, Elder avoids technical jargon in this text, even though he is a practicing physicist; however, when the unavoidable technical term arises, it is defined in the attendant glossary. Further, he uses the NIV version of the Bible for textual citations throughout the text (which may reflect his targeted popular audience). A generous end notes section is provided at the close of the text.

In the introduction, I sensed that Elder was proverbially preaching to the choir, noting that God had a “plan” for each one of us from all eternity, as demon-

strated by the creation of the heavens and the earth. He notes that modern physics enables the position of God creating the earth in a dual time frame, one which could be experienced at one place as a billion years, e.g., but at another as a “day.” As a result, he notes that the six 24-hour-days model of creationists and the physicist’s 13.7 billion year model are not logically inconsistent with one another. In the first chapter, Elder stipulates that God *must* be outside of time, inasmuch as the past, present, and future are all accessible to him at once, and he contends that the first glow of escaping light photons originated when the Spirit of God was “hovering over the waters” (p. 15). With these two assertions by Elder—regarding the “day” of creation and the Spirit “hovering over the waters”—my first criticism of this text is found. At various junctures he employs an analogical reading of Scripture, only to then turn right around and employ a woodenly literal interpretation of the text; one wishes that he would be consistent.

Chapter two—for all intents and purposes—is a sermon on the two complementary models of physics discovered by the twentieth-century physicists, Einstein, Schrödinger, and Heisenberg, regarding relativity and the uncertainty principle. Elder goes on to elaborate on how he thinks God is sovereign over chance, using proof texts from Proverbs as the basis of his extrapolation. Citing Heisenberg’s uncertainty principle, he points out that this allows God to control the universe *moment by moment*, since it is clearly taught in Scripture that God alone is sovereign over all.

The third chapter continues Elder’s, at times, woodenly literal interpretation of Genesis 1. Therein, he details what God did on *each* day of the “week” of creation. For example, he argues that God accelerated photosynthesis on day three, standardizing the form of the sun on day four (but one wonders, how did photosynthesis occur without a standardized sun?), and adding living creatures on days five and six (pp. 50–1). He claims that each movement upward in biological complexity constitutes an act of *special* creation by God, which indicates that evolution is in need of a “helping hand” by God (p. 51). Moreover, he advocates a literal Adam and Eve, the first couple from which original sin—as a quasi-genetic abnormality—is derived (note, both of these positions find less than consonance in modern theology and science circles).

In explicating his view of miracles (chap. 4), Elder notes that modern day Armenia is the site of the *Garden of Eden* (p. 65). Chapter five discusses the authority of Scripture, and then chapter six transitions back to science in order to assert that it does testify to the truth of God’s actions in the world. Therein, he also argues for what I would call a “regularity view” of scientific laws, one that pictures the laws merely as approximate, which would support his earlier theses regarding the possibility of miracles in chapter four. The seventh chapter furthers his contention that God is outside of time, and the eighth extends this thought to what he refers to as “soul time,” which allows for the possession of eternal life in the here-and-now. Chapter nine depicts how reality will be re-defined at the eschaton—both for the lost and for the saved. He concludes the book with a mandate to conduct godly science, and an exploration of God’s plan for the church.

# Book Reviews

In sum, I found this book to be disappointing. Perhaps my expectations were wrong, but I did not figure on getting a proof-text argument for the existence of God. Nevertheless, for those who desire to use Scripture as a sword that not only illuminates, but also cuts away, this title might be profitable. I could see it being used as a text for apologetics at fundamentalist institutions of higher learning

*Reviewed by Bradford McCall, Regent University, Virginia Beach, VA 23325.*



## PHILOSOPHY & THEOLOGY

**THE GROANING OF CREATION: God, Evolution, and the Problem of Evil** by Christopher Southgate. Louisville, KY: Westminster John Knox Press, 2008. 196 pages, index. Paperback; \$24.95. ISBN: 9780664230906.

### REVIEW I

A pelican typically lays one egg and then two days later a second egg. Once both are hatched, the older chick harasses the younger sibling. The younger chick is usually forced from the nest to die from starvation, predators, or exposure. This two-chick method ensures that the breeding season will produce at least one adolescent pelican, but it also means a nasty and short life for half of the pelican chicks.

While there is extensive literature addressing why God allows human beings to suffer, Southgate focuses in this book on why God has created a world where individual animals suffer as does the second pelican chick. Southgate is convinced that suffering can be necessary to the health of a population and species. In the short term, wolves taking down a sick deer can save the herd, and in the long term, killing the weak can strengthen the species. Southgate is morally stricken, however, by the individual animal that dies slowly from parasitic infection or a gaping wound. Such an animal did not have a complete life. Evolution posits untold billions of such individuals over eons of time. Why would God create a process where so many innocents suffer so acutely?

Southgate points out that the problem is heightened if God sovereignly chooses to ordain every action of every creature, if God intervenes at intervals to keep the process the way that God wishes, or if a curse on human actions is falling on the innocent. In contrast, Southgate develops an Irenaean perspective that God has established a process that at high cost makes possible the best ends. The world is good because what it will become is worth the price of the harms that occur en route. Despite the presence of suffering, God can still be known as creative, redemptive, and all-loving. God suffers with creation in the cross and inaugurates the transformation of creation in the resurrection.

It is the resurrection for human beings and sentient animals that makes it possible for this God-given, but suffering, world to be a just one. For Southgate, God's justice demands that each of the individual sentient creatures that suffered along the way will be resurrected as an individual to a better life. He admits that the expectation

of an individual animal resurrection has no direct biblical proclamation and few theological champions, yet he is not alone. For example, John Wesley hoped as much, especially for his horse.

As to human responsibility until the resurrection, Southgate writes on the basis of Rom. 8:19–21, that human beings are called to mitigate animal suffering as part of ushering in God's new creation. Inclusive neighbor love is to extend to animals, granted that, while humans and animals are of the same earth, there remain crucial differences between them. In the last chapter, Southgate offers two concrete implications for action. He argues that there is a human obligation to protect species from extinction, and that while predators and people may still eat animals, such should only be in needed quantities after the prey animal has lived an appropriately fulfilled life. Animal predators cannot gauge this, but people can and so are responsible to do so. What is to be avoided is not death, but rather a life that is not complete.

Both awareness of animal suffering and of our responsibilities for animals within the earth's ecosystem are increasingly center stage. Southgate has done a great service in stating clearly some of the challenges that animal life and death raise for theology and ethics, several possible responses, and his own thoughtful prescription.

*Reviewed by James C. Peterson, R. A. Hope Professor of Theology, Ethics, and Worldview, McMaster University Divinity College and Faculty of Health Sciences, Hamilton, ON L8S 4K1.*

### REVIEW II

Christopher Southgate, the author of *The Groaning of Creation: God, Evolution, and the Problem of Evil*, serves as Honorary University Fellow/Research Fellow in Theology at the University of Exeter, England. He is also general editor and principal author of *God, Humanity and the Cosmos*, 3d ed. Southgate originally trained as a biochemist at the University of Cambridge.

The book under review constitutes an excursion in evolutionary theodicy. According to the publisher's blurb,

Southgate argues that pain, suffering and extinction are intrinsic to the evolutionary process. The world that is "very good" is also "groaning in travail" and subjected by God to that travail. Southgate evaluates several attempts at evolutionary theodicy and then argues for his own approach, an approach that takes full account of God's self-emptying and human beings' special responsibilities as created co-creators.

This approach Southgate dubs a "compound evolutionary theodicy" which he bases upon his own "Trinitarian theology of creation and redemption."

Southgate's chief burden is to grapple with the under-addressed (especially by evangelicals) issue of animal suffering. In terms of theodicy, the most difficult issue to deal with has to be that of animal suffering, because animals, so it has always been held, have no sense of morality, no conscience, and thus no sinfulness, no moral accountability to their Creator. Their suffering is thus undeserved and apparently pointless. Southgate's specific concerns emerge in the following quotes:

One of the core assumptions of Christian thought is the affirmation that God's creation is good. The beautiful rhythms of the first chapter of the Hebrew Bible culminate in the assertion that "God saw everything that he had made, and indeed, it was very good" (Gen. 1:31). However, humans have always known that the nonhuman creation contained violence and pain; the young lions, to quote the Psalmist, roar, seeking their food with God (Ps. 104:21).

Though animal suffering was known before Darwin, the narrative of evolution that emerged in his work stretched the extent of that suffering over millions and millions of years and millions of species, most of them now extinct.

We can now see why pain and violence are endemic in nature. We can also see the beginnings of a possible theodicy; values arise in evolution along with the disvalues.

Perhaps a few remarks on "theodicy" in general would be useful at this point. A theodicy is a rational defense of God's goodness, omnipotence, and omniscience (i.e., the God of Christian theism) in the face of the all-too-real existence of evil and suffering. It is an attempt to solve the problem of evil and suffering, historically the principal stumbling block to theistic belief among thinking people. The term derives from *theos* (God) and *dikē* (judgment, justification, right). A theodicy attempts to "get God off the hook" for all the evil and suffering in the world: how could a God who is omnibenevolent, omnipotent, and omniscient possibly allow evil and suffering, especially what is sometimes called "gratuitous" evil—evil and suffering (particularly of the innocent, such as small children and animals) that has no apparent point?

Yet interestingly, Southgate does not work with this traditional notion of theodicy. He writes,

I am not seeking to prove the existence of God to those who do not believe, or yet to refute arguments against the existence of God. I am working within the community of belief to face the problems and tensions that come as we try to understand the God who made this world and who, Christians believe, acts to save it.

Southgate wants to rationalize for *believers* how an omnibenevolent, omnipotent, sovereign, and fully responsible God *who is worthy of our worship* could ordain evolution with all its disvalues as the means of creating and sustaining animal life. As he himself puts it most succinctly,

I am trying to see how the two propositions (a) God is creator of this ambiguous world, which is "good" but also "groaning in labor pains," and (b) God is "worthy of worship" can be held together within the community of faith.

Southgate dismisses not only creationism and Intelligent Design as viable starting points for engaging with the debate about animal suffering, but also "models of God that remove the idea of his having created all that exists, or that dispute his goodness" and schemes that blame creation's disvalues on a Fall. He rejects a historical Fall because he sees no evidence of a "primordial paradise." Yet Southgate's entire argument and approach relies heavily upon Rom. 8:19–22, where we see creation groaning in frustration, in bondage to decay, waiting eagerly

"for the sons of God to be revealed" so that it may be liberated. In the context of Paul's overall argument in Romans, however, it is hard to see how this current misery of creation could have been brought about by anything other than humans' Fall from paradise. This brings into sharp focus the issue of Southgate's bibliography; unfortunately, Southgate nowhere addresses what he thinks of Scripture or the issue of biblical hermeneutics.

Southgate affirms such classical Christian doctrines as Trinitarianism, *creatio ex nihilo*, resurrection, and final consummation. These doctrines allow him to reject the traditional Whiteheadian process metaphysic, while admitting the process notions of a dynamic cosmos, divine responsiveness and co-suffering, and ultimate divine sovereignty. He also ultimately rejects the evolutionary theology of Pierre Teilhard de Chardin because of, among other things, Teilhard's notion that God uses "evolutionary centration" to bring about a convergence upon a glorious, God-centered eschaton, rather than the biblical means of "the mighty redeeming act of God inaugurated in the Cross of Christ." In addition, drawing upon the work of Annie Dillard (*Pilgrim at Tinker Creek*) and Holmes Rolston III, Southgate helpfully distinguishes between the evolution-induced disvalue of the suffering of the individual animal, on the one hand, and the evolution-induced value of the survival of that animal's species that this suffering helps to make possible, on the other.

The basic contours of Southgate's "compound evolutionary theodicy" appear as follows:

1. The goodness of creation engenders many sorts of values.
2. Pain, suffering, death, and extinction are intrinsic to a creation evolving according to Darwinian principles.
3. An evolving creation was the only way God could engender all the beauty, diversity, sentience, and sophistication we see around us in the biosphere. (Southgate calls this the "only way" argument.)
4. God co-suffers with every sentient being in creation.
5. The Cross of Christ is the epitome of divine compassion, God's assuming of ultimate responsibility for creation's pain. Along with the Resurrection, the Cross inaugurates the transformation of creation, making possible the redemption of even the nonhuman creation, the eschatological doing-away with creation's groaning.
6. The need to give an account of how a loving God of loving relationship must provide an eschatological fulfillment for creatures that have no flourishing in this life. Such a God could never regard such a creature as a mere evolutionary expedient. This leads Southgate to posit an eschatological afterlife for individual animals.
7. Humans are of particular concern to God, if divine fellowship with creatures such as us is in any sense a goal of evolutionary creation. This makes human beings "co-redeemers" (or "co-creators") with God, or perhaps "stewards or priests or contemplatives of creation," with respect to the nonhuman creation and the healing of the evolutionary process. This leads Southgate to vegetarianism and a project to end biological extinction.



## Book Reviews

Points 1 and 2 (above) leave us with a dualistic view of creation—its glories (values) as well as its horrors (disvalues). Southgate calls this the “ambiguity” of creation. Points 1 and 2, when coupled with point 3, lead us to the proposition that the values of point 1 are not achievable except by the awful disvalues of point 2. God himself is fully responsible, then, for the horrific disvalues within creation, since he is the one who chose to use evolution to accomplish his ends. Points 4, 5, and 6 address the problem of animals whose lives are frustrated in that they do not achieve the “flourishing” intended for them and/or whose lives are rife with unrelieved suffering. Point 7 addresses how it is that we humans should respond to the plight of the nonhuman creation, in light of God’s purposes for us and for it.

Parts of Southgate’s theodicy are highly speculative, and he usually admits as much. But one wonders at the need for and the fancifulness of some of the speculation. For example, Southgate develops a Trinitarian “theology of creation” which includes the notion that God’s self-emptying love (kenosis) drives relationships within the Trinity as well as God’s relationship to the world. “The Father whose self-abandonment begets the Son, the Son whose self-emptying gives glory to the Father, these in the power of the Spirit give rise to living selves.”

Throughout *Groaning*, Southgate interacts with a plethora of theologians, philosophers, and ethicists. Some parts of the book contain string upon string of quotations. The downside of this is that most of the originality in the book’s overall argument (the speculative passages excepted) consists merely in the novel ways in which Southgate puts the quotations together. The upside is that *Groaning* is erudite, nuanced, and sophisticated both theologically and philosophically (almost 50 pages of endnotes and an 11-page index for a text of just 133 pages).

However, the book’s argument will likely be viewed by those adhering to the orthodox tenets of the Christian faith as ultimately failing to achieve its ends, due to its acceptance of and reliance upon thoroughgoing neo-Darwinism and its rejection of a historical fall of the human race from a “primordial paradise” into sin. For such readers, the book’s main value will probably lie in its concluding ethical proposals as to how we humans might view our calling with regard to the nonhuman creation. Southgate does offer us some very useful insights into how Christians ought to approach such issues as vegetarianism, global justice, global warming, abattoirs, and the ethics of extinction.

*Reviewed by Tim Deibler, Headmaster, Grace Academy, Georgetown, TX 78633.*

**GOD AFTER DARWIN: A Theology of Evolution**, 2d ed. by John F. Haught. Boulder, CO: Westview Press, 2008. 219 pages. Paperback; \$30.00. ISBN: 9780813343709.

John F. Haught is a distinguished research professor of theology and a Senior Fellow in Science and Religion at Woodstock Theological Center at Georgetown University. This work is an expansion of Haught’s first edition titled the same, published in 1999. The motivation of this work is centered on the author’s involvement in the court case *Kitzmiller et al. v. Dover Area School District*. Haught was

a witness on behalf of the plaintiff providing testimony to argue that intelligent design is basically a religious idea and it would violate the standing laws of the U.S. Constitution to teach it in the public schools (p. xii).

Haught admits that the main assertions and/or content of this book remain similar to the first version with the exception of some clarifications and comments concerning his involvement in the aforementioned trial. Once again what Haught is attempting to do is to take Darwinian thought and the scientific evidence supporting evolutionary biology and find a theology that is synergistic or “engages” with it. This is not a book that wishes to participate in a debate concerning this scientific evidence, but rather wishes to find a theology consistent with it.

Haught would contend that the classic positions of the current debate (evolutionary naturalism vs. creationism) share in common an overarching hypothesis that what Darwin put forth in his writings (e.g., the process of natural selection) is essentially atheist/materialistic in its theology. Haught asserts that it is not a foregone conclusion that evolutionary biology necessitates the removal of a “hierarchical vision” of reality. Furthermore, he wishes to show that this is, in fact, a false debate. On the one hand, there are scientific assertions (composed of facts verifiable through the scientific method) that should not have any specific metaphysical ramifications, and on the other, there are metaphysical assertions that do not have any naturalistic implications. Haught’s aspiration is to posit a theology that is not an affront to evolutionary biology as put forth by Darwin. Rather, in some sense, he wishes to assume it and then find God within this schema. Haught spends the first seven chapters of the book on this very idea.

He borrows heavily from process theology (Whitehead) and modern Catholic theology (Rahner and others), and demonstrates his breadth as a theologian by engaging other philosophical worldviews that help best explain this developing theology. What results is a well-developed theology of evolution that takes seriously the assertions of evolutionary science and attempts to maintain the theological traditions of his Catholic faith. In order to accomplish this, Haught asserts the “metaphysics of the future” as the rubric in which he finds the Divine as the appointed end that the universe is being drawn toward and as the best explanation for the novelty found in the evolutionary process, rather than the mechanical (read algorithmic) processes put forth by evolutionary materialists. Evolutionary science then becomes the description of the process of forming and transforming the universe into increased levels of beauty as it moves toward Haught’s modern version of Teilhard’s “Omega point.”

Haught’s theology is both well developed and systematically constructed, and therefore it is required to be taken seriously. This is a must read for anyone who wishes to balance a theistic worldview with the desire to allow scientific evidence to speak on its own terms without metaphysical predispositions.

Yet the theology put forth in the pages of this book is not without some difficulties. Haught’s theology of evolution does suffer some from a lack of a universal,

objective point of reference from which to ground his metaphysical tenets. His acknowledgment of continual novelty in the universes makes it difficult for his truth claims to contain an objective meaning. In a truly dynamical system in which everything is in process and subject to change, what can be posited other than novelty itself and what truth claims can be known now that are not subject to the same volatility to which the universe itself is subject? So while Haught asserts God as the ultimate realization or fulfillment of this dynamical system that is the universe, it is not clear what can be known concerning this eschatological vision, nor is it entirely clear that this eschaton is consistent with the biblical narrative.

Questions concerning his theology notwithstanding, Haught's work should provoke a much larger, more meaningful discussion as to what the nature of the debate between the theological community and the scientific should be. This is a welcome and valuable contribution to the discussion and may represent a path forward in which science serves to annotate and demonstrate divine action, and theology takes scientific information seriously and acknowledges it as a revelation of the divine.

Reviewed by Kyle Hilton, Vestal, NY 13850.



## RELIGION & BIBLICAL STUDIES

**VICTORIAN RELIGION: Faith and Life in Britain** by Julie Melnyk. Westport, CT: Praeger, 2008. 232 pages. Hardcover; \$49.95. ISBN: 9780275991241.

Russian literary critic Mikhail Bakhtin (1895–1975) celebrated novelistic heteroglossia—the different tongues of multiple perspectives—as preferable to the single voice of a lyric poem. His paradigm could be applied to discussions of Victorian religion, which tend toward “monologism,” Bakhtin’s term for an approach which legitimizes only one perspective. And the perspective most often validated by Victorian scholars is one of loss: a loss of faith in Christian verities, bred when a church complicit with aristocratic privilege could not provide an effective prophylactic against the skepticism engendered by scientific discovery and the German higher criticism.

Julie Melnyk challenges such monologism in her heteroglossic *Victorian Religion: Faith and Life in Britain*. This is not to say she ignores the so-called “Victorian faith crisis.” But she gives it only one chapter out of eight, substituting the word “unsettlement” for the more dramatic and seemingly all-encompassing term “crisis,” thus signaling that atheism and agnosticism were merely two religious tongues among numerous others during the Victorian era. In fact, Melnyk’s chapter on “The Victorian Religious Unsettlement” provides the least new material for fans of Victorian literature, since it presents what many of us have already been taught about Victorian religion.

Far more interesting are Melnyk’s numerous examples of vibrant Christian practices during the nineteenth century, from Dissenter activism to Tractarian ritualism, from the evolution of Sunday Schools to the development of family devotions. Surprisingly, one might conclude from the data Melnyk presents that life in church and

chapel was far more vigorous at the century’s end than at its start, largely due to the passionate engagement of Christians at opposite ends of the Anglican continuum: low church Evangelicals and high church Anglo-Catholics (Melnyk distinguishes between evangelical dissenters and Anglican Evangelicals with the capital “E”). She notes that “formal weekday services ... became more common later in the century” (p. 78); that inhibitions about taking communion were changed “under Evangelical and Tractarian influence,” such that “regular communion became an accepted part of most Anglicans’ worship” (pp. 81–2); and that, “after Catholic Emancipation in 1829 and the restoration of the hierarchy in 1850,” the number of Roman Catholic convents grew from sixteen in 1830 to nearly six hundred by century’s end (p. 131).

In addition to describing the heteroglossia of Victorian religion, Melnyk practices heteroglossia as Bakhtin defined it. She presents diverse beliefs and practices with sympathy, as though she were an apologist for each. Avoiding clichés about Victorian prudery she discusses Christian concern for prostitutes, celebrating Evangelical development of the “family home system,” which placed prostitutes in home-like (rather than institutional) settings in order to give them alternative life skills. She even makes us sympathetic with the temperance movement, demonstrating not only its legitimacy, but also the heteroglossia of its supporters, from the British Women’s Temperance Association to the Chartists, who “saw drunkenness as a barrier to the achievement of full political rights for the working classes” (p. 93). Nevertheless, as she admits, the temperance movement “left its mark on Christianity in Britain, increasing the reputation of evangelicals as killjoys and, late in the century, further alienating working-class men from religious practice” (p. 94). Some readers will recognize this latter admission as the only perspective on Victorian temperance they had been given in the past. Melnyk, in contrast, offers heteroglossia rather than monologism.

And many of the tongues she includes are female, telling stories of explicitly Christian women who made a difference in Victorian culture: Octavia Hill, an activist in housing reform, who converted tenements to livable spaces for low income people; Josephine Butler, who successfully campaigned against the double standard in prostitution law; Emma Jane Worboise, who edited the *Christian World Magazine* for twenty years, arguing that “there is no profession more truly sacred than authorship; like the ministry, it ought to be a vocation rather than a profession” (p. 110). These women illustrate one of Melnyk’s points: the Christian faith, both in Anglican and dissenting forms, allowed, if not encouraged, women to exercise their gifts and take leadership in ways that influenced and changed Victorian culture. Though such women were in the minority and were denied official positions in the church, their example subverts the monologic cliché that Christianity suppressed female talent and leadership.

The only thing that bothers me about *Victorian Religion*, aside from some redundancy, is the stylistic oddity of the third chapter. Melnyk begins the chapter by saying, “Imagine that you are a young Victorian man, and you have decided that you want to be a clergyman in the

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Church of England" (p. 52). She then uses the second person to inform the reader about requirements and events in the ordination process, saying things like, "So if you have Whiggish sympathies, perhaps Cambridge would be the better choice" (p. 53). She thus creates a tone disharmonious not only with the rest of her book, but also with adjacent passages that employ expository prose. Perhaps this approach reflects Melnyk's presumed audience, as stated in the book's foreword:

The book's clarity and its plentiful examples make it enormously useful to novel-readers, to teachers, and to anyone interested in the political and social as well as the theological meanings attached to religion (p. xi).

Notice that Victorian scholars are not included in the list, many of whom might feel frustrated by the book's limited citations—not only for sources of Melnyk's data, but also for current scholarship on issues that she addresses. One glaring omission is Timothy Larsen's *Crisis of Doubt: Honest Faith in Nineteenth-Century England* (Oxford, 2006), a book that explicitly challenges the monologism of traditional scholarship on Victorian religion. Larsen's examples of skeptics who reconverted to Christianity would have enriched the tones of Melnyk's heteroglossia.

Despite this lack, I found *Victorian Religion* well worth reading. Though much was familiar territory, especially when Melnyk quoted canonical Victorian authors—Dickens, Eliot, Tennyson, Trollope, Bronte, Ruskin, Darwin, Huxley, Arnold, Clough, the Brownings, etc.—I reveled in a multitude of details that made Victorian culture, and our inheritance from it, speak in new tongues.

Reviewed by Crystal Downing, Professor of English and Film Studies, Messiah College, Grantham, PA 17027.

## RELIGION & SCIENCE

**REINVENTING THE SACRED: A New View of Science, Reason, and Religion** by Stuart Kauffman. New York: Basic Books, 2008. 320 pages. Hardcover; \$27.00. ISBN: 9780465003006.

Stuart Kauffman is one of the leading experts in complexity theory and emergence in the general area of the biosphere. The first ten chapters of this book are devoted to his specialty and present a strong, compelling argument for the existence of the sacred in nature. All ASA members should read these chapters. However, there are serious problems with the rest of the book, where he jumps out of his area of expertise.

Kauffman's motivation for this book is described on the first page of chapter 10:

What about all the aspects of the universe we hold sacred—agency, meaning, values, purpose, all life, and the planet? We are neither ready to give these up nor willing to consider them mere human illusions. One response is that if the natural world has no room for these things, and yet we are unshakably convinced of their reality, then they must be outside of nature-supernatural, infused into the universe by God. The schism between religion and science is, therefore, in part, a disagreement over the existence

of meaning. If meaning were to be discovered scientifically, the schism might be healed.

Both the content and method of Kauffman's presentation is much more palatable to the scientific community than are the attempts of the ID movement to use science to argue for design.

Kauffman, who studied philosophy at Oxford, uses his first four chapters to argue both scientifically and philosophically against the adequacy of reductionism. Reductionism is the belief that all explanatory arrows point downward to the most elementary constituents and fundamental laws. Among his many arguments, Kauffman considers Weinberg's dream of a final theory in which basic fundamental principles would explain everything, including the finely tuned constants of nature. He then points out that a more common approach is the so-called "weak anthropic principle" in which our universe, among endless multiverses, by chance has the right properties for life. Although the multiverse approach undermines the goals of reductionism, both approaches make the fine tuning meaningless. Kauffman's beliefs do not allow a search for meaning in the anthropic principle. The word "scientifically" in the chapter 10 quote refers to purely natural processes with supernatural agency excluded.

Nevertheless Kauffman can give many powerful arguments for the sacredness and meaning of nature. Whereas pure chance is the primary explanation for the weak anthropic principle, chance plays a more minor role in Kauffman emergence theories. Chapter 5, "The Origin of Life," argues that there are emergent, spontaneous, self-organizing processes involving so-called downward causation in which a system's complexity creates constraints which are partially causal. This creates totally new phenomena beyond the explanatory power of natural laws of physics, but does not violate these fundamental laws. Chapter 6, "Agency, Value, and Meaning," follows from Kauffman's discredit of reductionism. The teleological language refers to autonomous agents within nature. Kauffman believes agency arose in evolution. Chapter 7, "Cycles of Work," digs deeper into the concept of agency, how one molecule instructs another. Kauffman also looks at the meaning of "information."

Chapter 9, "Nonergodic Universe," argues that all the happenings in our universe are not repeatable and that not everything that can happen will happen. Chapter 10 is a culmination of the first nine chapters, discrediting determinism ("simple happenings") of physics and opening up the sacred. Here Kauffman makes a big issue of Darwinian pre-adaptations. These are incidental features of a complex system which turn out to have selective significance when their environment changes. He clarifies his case for causally anomalous happenings, not governed by natural laws and also not algorithmic (not formulated mathematically). For example, he considers Michael Behe's so-called irreducibly complex bacterial flagellum as a pre-adaptation. He points out that one cannot use probability statements about pre-adaptations (not algorithmic) and therefore the important probability arguments used by the ID movement are in error.

In the second half of the book, Kauffman extends his ideas to areas in which he lacks expertise: the economy,



mind, quantum brain, theodicy, ethics (where Kauffman has a strong philosophical background), and morality. Other issues are C. P. Snow's two cultures, the humanities and natural sciences, that Kauffman wants to bring together through their commonality, and a global ethic dealing with the environment. The primary goal of this book is to heal the schism between science and religion. Kauffman sees the importance of religion in the history of civilization, but he is also obsessed with the evils of fundamentalism in religion. Elsewhere ([www.templeton.org/belief](http://www.templeton.org/belief)) he says,

I believe that reinventing the sacred is a global cultural imperative. A global race is under way, between the retreat into fundamentalisms and the construction of a safe, shared space for our spirituality that might also ease those fundamentalist fears.

What disturbs me most about this book is that Kauffman has a naive, faulty view of the God of the Bible. He subsequently hopes that he can get many fundamentalists to replace their personal Savior with a fully natural pantheistic god. Setting this aside, I think we can learn from Kauffman about his deep insights into complexity theory, and gain a better understanding of how our personal God works in creation and possibly how we as humans have free will.

*Reviewed by William Wharton, Professor of Physics, Wheaton College, Wheaton, IL 60187.*

**ADAM'S ANCESTORS: Race, Religion, and the Politics of Human Origins** by David N. Livingstone. Baltimore, MD: The Johns Hopkins University Press, 2008. 301 pages. Hardcover; \$35.00. ISBN: 9780801888137.

David N. Livingstone is a professor of geography and intellectual history at Queens' University Belfast and surely ranks as one of the most talented and perceptive scholars currently working on the history of science and religion. He has written a marvelous history of the idea of non-Adamic humanity from medieval times to the present.

Although fleeting glimpses of pre-Adamism can be detected earlier, Livingstone essentially begins his account with the European voyages of discovery and the revival of classical learning during the Renaissance. Moderns tend to underappreciate the intellectual jolt Europeans experienced as a result of the encounter with the New World. A host of exotic new species and landscapes, not to mention the variety of indigenous peoples and cultures, prompted a few thinkers to dabble with the notion that Adam may not have been the progenitor of the entire human race and that non-Adamic peoples might be thriving in other parts of the world.

What started haltingly in the sixteenth century became a major debate by the mid-seventeenth century with the appearance of Isaac La Peyrère's treatise *Men before Adam* (*Prae-Adamitae*) in 1655. La Peyrère claimed that humans existed before Adam, who was only the father of the Jews. In so doing, he not only opened the door for plural origins of human species (polygenism) but also gave impetus to the practice of biblical hermeneutics. The implications were stunning. By allowing extrabiblical considerations

to enter into biblical exegesis, La Peyrère entertained a number of heretical notions that called into question the doctrine of original sin. Predictably, his work generated a storm of controversy and a host of critics. But La Peyrère's pre-Adamite project was so conceptually versatile, as intellectual historian Anthony Grafton has noted, that it was enlisted in various forms to challenge such things as the standard reckoning of the age of the world, the manner in which sacred texts should be read, and eventually biblical authority itself.

Pre-Adamite thinking flourished during the eighteenth-century Enlightenment, as La Peyrère's speculations were imported into the realm of cultural politics. Underlying the various scientific concerns were "political fixations" (p. 79). Thinkers elaborated moral maps of the globe, based, for example, on the notion that inhabitants of northern climates were morally superior to the "people of indolence" from the tropics. Others used claims about human origins in their debates about the morality of slavery.

There was an extraordinary conceptual realignment in the nineteenth century. Pre-Adamite arguments moved "from heresy to orthodoxy, from skepticism to apologetics" (p. 91). Pre-Adamism was used to harmonize science and religion and protect the Bible "from the results of infidel science" (p. 80). For example, it was employed to preserve the integrity of the Genesis narrative in the face of geologists' claims of deep time. With Darwin things got even more interesting: evolutionary or monogenetic pre-Adamism emerged. "For a significant body of opinion," Livingstone maintains, "the coming of evolution meant the birth, not the death, of Adam ... Adam had a navel, for Adam had ancestors" (p. 137). Wishing to retain something of the Genesis narrative while also embracing evidence for human evolution, some Christian thinkers adopted a position that is still invoked today in conservative theistic evolutionary circles: Adam "was physically born of pre-Adamite parents but was the first recipient of a truly human soul" (p. 167).

The second half of the nineteenth century saw the heyday of pre-Adamism, not only because it was embraced in harmonizing schemes, but also because it was pressed into the service of racial supremacism. Throughout the book, Livingstone clearly demonstrates that to understand pre-Adamism one must appreciate its versatility and adaptability. In addition to being incorporated variously in the dialogue between science and religion, pre-Adamism was often enlisted to support racist notions and practices of the foulest nature.

Pre-Adamite thinking did not end with the nineteenth century. It can still be found in the thinking of many who struggle to salvage some sense of a historic Adam that is consistent with scientific evidence. And, regrettably, racist pre-Adamism is present in noxious fringe groups such as the Christian Identity movement.

*Adam's Ancestors* is a model of meticulous historical scholarship. It is greatly enhanced by a geographer's sensitivity to the role of place in intellectual history. But it is more. Livingstone inserts perceptive normative analysis in his genealogy of an underappreciated idea. He argues that harmonizing systems of science and religion are not simply "bridges between two independent domains"

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(p. 138); they are mutually transformative. “Harmonizing schemes are not to be thought of as passively zipping together two separate sets of belief. They are, rather, agents actively fashioning both scientific theory and religious doctrine into new forms” (p. 220). They dispose their advocates to certain explanatory alignments, both scientific and theological; indeed, they “transform the very notions they seek to unite” (p. 221). No doubt many readers of this journal will concur.

*Reviewed by Donald A. Yerxa, senior editor of Historically Speaking and co-director of the Historical Society, Boston, MA 02215-2010; Professor of History, Eastern Nazarene College, Quincy, MA 02170.*

**THE BIBLE, ROCKS AND TIME: The Geological Evidence for the Age of the Earth** by Davis A. Young and Ralph F. Stearley. Downers Grove, IL: IVP Academic, 2008. 510 pages. Paperback; \$30.00. ISBN: 9780830828760.

This book should not have been written. Or let me rephrase things: It should not have been necessary that this book had to be written. Or let me even re-rephrase things: I am sorry that this book had to be written, but I am so glad that it was written and that it was done in such a splendid fashion.

*The Bible, Rocks and Time: The Geological Evidence for the Age of the Earth* is authored by two earth scientists, Davis A. Young and Ralph F. Stearley, deeply committed Christians in the Reformed tradition, who taught alongside each other for many years at Calvin College, in Michigan. Their aim was simple. First, they wanted to show the great age of the earth, as established by the best science and as collaborated by so many fields of inquiry. Second, they wanted to tackle head-on the objections that are brought today by the biblical literalists, supporters of the position known as young earth creationism (YEC). Third, and most importantly, they wanted to show that Christians cannot merely accept modern science but can rejoice in it. It comes through the use of our senses and our intelligences, the very things that make us in the image of God, and something that testifies to his creation and glory. YEC is not merely bad science. It is bad religion also.

The book is divided into four parts. The first, Historical Perspectives, leads us through the history of geology, from the beginnings at the time of the Scientific Revolution in the seventeenth century, through the nineteenth century and on to the twentieth century and to the great importance of molecular theories, especially about the decay of materials from one form to others. (There is much more on the actual science in later chapters.)

Next comes Biblical Perspectives. Here the authors are treading a fine line. They want to break with the early chapters of Genesis taken as science. Yet clearly they want to accept much of the Bible as true, meaning really true and not just symbolic. Take Adam and Eve. I can see going all the way from saying Adam and Eve literally existed only on the sixth day and then the drama started, to saying that in some sense there was a pair (or perhaps a group) who were the first humans and who sinned, to saying that Adam and Eve are purely metaphorical and that our sin (which is very real) is in some sense

a part of human nature, a natural part of human nature. For myself, as someone raised a Quaker (and hence more keen on the inner light than on the word of the Bible), I suspect that my preference would be for a more liberal interpretation than that of the two authors. The strength of a book like this is that it does not give final answers but challenges you to think again about these issues. What is this if it is not exercising your God-given talents?

We move on to Geological Perspectives which includes lots of information about fossils and the geological record. George McCready Price, the Canadian Adventist, who set the terms of the discussion for YEC, used to argue that the fossil record is all an artifact of the flood—the slow organisms like dinosaurs got caught at the bottom of the hills, the fast organisms like humans got caught at the top of the hills. Read Young and Stearley on the topic and then realize how silly YEC really is. The point is that it is not just silly, it is boring. Real science, good science, is exciting, it is beautiful. It is hard, it is tough. But then, whoever said that getting at the truth would be easy and simple? Certainly not Saint Paul.

Finally, we have Philosophical Perspectives. Here the authors try to tie together a number of strands, for instance about the nature of geology and the underlying assumptions that scientists make about the order of nature, and about the role and necessity of lawlike thinking. Then, right at the end, Young and Stearley turn to more theological issues, especially about the unity of the picture that God has presented. It is not a coincidence that one finds parallels between the Book of God and the Book of Nature. Their plea is that Christians will recognize this fact and get on with the job of exploring the creation, not denying it.

There were times, frankly, when I found this book rather long. Like most college professors, they rarely use a sentence when a paragraph will do. But their love of their science and their love of their Creator comes through on every page. Anyone who had these men as a teacher was privileged indeed. We are lucky that they shared their learning and their enthusiasm with the rest of us.

*Reviewed by Michael Ruse, Lucyle T. Werkmeister Professor of Philosophy and Director of the HPS Program, Florida State University, Tallahassee, FL 32306.*

**PRACTICAL MYSTIC: Religion, Science, and A. S. Eddington** by Matthew Stanley. Chicago: University of Chicago Press, 2007. xii + 313 pages, 16 halftones, 2 line drawings. Hardcover; \$37.50. ISBN: 9780226770970.

Anyone who has ever read a book on the relationship of science and religion will appreciate the novelty and detail in this reading of the scientific and religious life of Sir Arthur Eddington (1882–1944). This is no abstract discussion of theological presuppositions versus scientific claims, no continuation of the sterile debate of the warfare thesis of science and religion, nor even a sustained defense of the harmonization of these two. Rather it is an effort to situate the interrelation of science and religion in the life of a single individual living in a particular time and place. What is new about this approach, even

extraordinary, to use an overused word, is the argument that a prior commitment by Eddington to uphold values, nurtured by his Quaker upbringing and the so-called Quaker renaissance, infuses Eddington's pioneering work in astrophysics (and relativity) and his efforts to popularize science. In short, the book is a reading of scientific practice through the eyes of religion. One will have to judge how successful the author, Matthew Stanley, has been in this endeavor. Presently an associate professor at the Gallatin School of Individualized Study, New York University, he has both an M.A. in astronomy and a Ph.D. in the history of science from Harvard University.

When H. E. Armstrong described the doctrine of valence in his entry in the eleventh edition of *Encyclopedia Britannica* (1911), he defined valence as "the doctrine of combining power of the atoms or elementary radicles of which compound molecules consist." Stanley uses the notion of valence to discuss values as the combining power or bridging element between religion and science. The subject is Sir Arthur Eddington, a practicing Quaker and renowned English astrophysicist, living in interwar Britain. At the time, a debate raged between those who advanced a sustained assault on religion and the promotion of scientific materialism, and those who advanced a natural theology harmonizing theology with the latest scientific findings, i.e., socialists versus the Anglican elite. Eddington sought to forge his own way and was strongly criticized by both camps for his efforts.

The first chapter describes the Quaker renaissance which energized the generally quietistic Quaker community to take a more active role in the world. The chapter details the making of Eddington as a religious scientist and his acquisition of "valence values," values which, although contested by others, help illuminate the complexity of the historical issues involved. Subsequent chapters are devoted to one of these critical "valence values" preeminent in Eddington's life: mysticism (chap. 2), internationalism (chap. 3), pacifism (chap. 4), experience (chap. 5), and the place of religion in modern life (chap. 6). These contested values structure and shape the argument of the book. One should not expect a straightforward biographical exposition. In chapter 7, the final chapter, Stanley reflects on the role "valence values" can play in the historiography of the interaction of science and religion. These values ground science and religion in history and overlap in interesting and stimulating ways, but mark well, in Stanley's "central methodological claim," these values are localized in time, form and place. Values are not transcendental, but provide an avenue for "seeing the invisible common ground between apparently separate spheres" (p. 242).

Perhaps one example may whet the reader's appetite. In chapter 2, "Mysticism: Seeking and Stellar Models," Stanley describes Eddington's take on religion: religion is a matter of continually seeking for spiritual truth. The contemporary Quaker emphasis on mysticism and religious experience functions as "the root of true religion." This seeking does not require either the dogmatic certainty offered by proofs of God's existence or a final appeal to inspired Scriptures. Rather it is a continual search for meaning and truths. Stanley argues that Eddington's commitment to the valence value of mysticism translates into a particular scientific methodology.

In Eddington's search for stellar models one discovers a pragmatic search for functional models rather than a mathematically deductive approach in which models are derived from first principles, as advocated by his contemporary rival James Jeans who held a mathematical model of truth. For Eddington, both scientific practice and religion are never ending processes. "Seeking, not finding, was the essence of science" (p. 74) and of religion.

By all means, read this fascinating, finely-crafted book.

*Reviewed by Arie Leegwater, Calvin College, Grand Rapids, MI 49546.*

**RELIGION AND THE PHYSICAL SCIENCES** by Kate Grayson Boisvert. Westport, CT: Greenwood Press, 2008. 317 pages. Hardcover; \$65.00. ISBN: 9780313332845.

In this tenth book in the Greenwood Guides to Science and Religion series, Boisvert emphasizes four themes in the science and religion dialogue. The first is that "things are not what they seem," because both science and religion deal with an "unseen world." Second, she highlights the "Copernican principle" which places Earth and humanity in a less central place. The third and fourth themes are searches for unity and a supreme being. Boisvert also sees the first three themes as characteristics of science itself in the twentieth century, which is her main focus.

The book covers a wide range of topics in the physical sciences that raise philosophical and religious issues. These include the beginning of the universe, the nature of matter, the quest for a unified theory, extraterrestrial life, cosmic evolution, and the fate of the universe. The information presented is mostly accurate, but is covered in a cursory manner with only about ten pages on each item listed. Also, technical terms are sometimes used without being defined. There is a fairly extensive bibliography that could point the interested reader in the right direction to learn more.

According to the introduction, "the book will examine at each step religious responses from scientists and from scholars and leaders in a variety of faith traditions." After briefly describing the science, Boisvert presents philosophical and religious implications raised by scientists. This is often done using the words of prominent scientists. These are interesting, but they do not necessarily reflect the beliefs of most scientists. No evidence is given when Boisvert makes claims about what many or most scientists believe.

In the first six out of eight chapters, Christianity is the primary religious perspective discussed. There are occasional mentions of Judaism (especially Kabbalism), Hinduism, and Buddhism. Islam is almost entirely neglected. Perhaps this is a reflection of the scholarship on science and religion that has been done, but the book does not live up to the expectations that it sets. Also, Boisvert often gives people's conclusions without the reasoning behind them, which is unsatisfying.

The seventh chapter is devoted entirely to the cosmology of Meher Baba, who is mentioned occasionally in earlier discussions of Hinduism. Boisvert justifies this emphasis on a single figure with the claim that "No description of cosmic evolutionary systems would be



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complete without including the perspective of a unique modern spiritual figure from India who has written extensively on the subject of creation and its purpose—Meher Baba.” She gives a rather glowing description of his work. For example, she writes, “It is hard to imagine a spiritual system more focused on the notion of directionality and divine purpose than that of Meher Baba.” Apparently no scientists have commented on Baba’s ideas, but that does not stop Boisvert from speculating on what their reactions might be. Boisvert writes that “comparison of different metaphysical systems is beyond the scope of this book,” but concludes that chapter with comparisons because of “the special interest taken by Baba in establishing unity among different religions.”

The book concludes with thirty-seven pages of excerpts from primary sources. These are provided, “so that the reader may experience firsthand the writings of major religious figures and a leading scientist.” In addition to three passages by Meher Baba, there are selections from the writings of Auroindo Ghose, a Hindu spiritual teacher, C. P. Ranasinghe, a Buddhist scholar, Albert Einstein, and Pope John Paul II.

It is refreshing to see a book that goes beyond the discussion of origins. Boisvert has done a good job of identifying an interesting set of issues. However, a much longer book would have been required to do justice to all of them, especially if they were all examined in depth from a wide variety of religious perspectives. The most disappointing thing about the book is the imbalanced emphasis on one perspective. The book’s title and introduction give no indication that this would be the case.

*Reviewed by Alan J. DeWeerd, Associate Professor of Physics, University of Redlands, Redlands, CA 92373.*



## Book Notice

**THE TWO BOOKS: Historical Notes on Some Interactions between Natural Science and Theology** by Olaf Pedersen (ed. George V. Coyne, S.J. and Tadeusz Sierotowicz). Vatican City: Vatican Observatory Foundation (distributed by University of Notre Dame Press), 2007. xix + 424 pages. Paperback; \$22.00. ISBN: 9788820979010.

If you have ever wondered how the metaphor of the two books entered our Western consciousness and shaped our habits of speech and reflection, this book, a series of edited lectures given by the distinguished historian of science Olaf Pedersen (1997†), should be of interest. Pedersen taught early physics and astronomy, and established the Institute for the History of Science at Aarhus University. Pedersen challenges the

authorized picture of the relations between “religion” and “science” as one long struggle between the forces of ignorance and authority against the powers of knowledge and freedom... There has not been one single struggle, but a long series of interactions from the very beginning of the scientific interest in nature, and in these interactions there has been a constant give and take (p. 311).

In the first seven chapters, Pedersen explores this “give and take” beginning with the birth of science, the early church fathers, the Carolingian Renaissance, medieval science and theology, and ending with the early modern science of Isaac Newton. This historical development is covered in fine detail, complete with extensive notes and numerous bibliographic references. The last chapter (chap. 8), “The Impact of Time,” explores the development of evolutionary thought and some of the theological reservations this engendered. The book’s appendix lists the complete works of Olaf Pedersen. A challenging, but rewarding, read.

*Reviewed by Arie Leegwater, Calvin College, Grand Rapids, MI 49546.*



## Letters

### Facing Abominable Mysteries

In his article “Flood Geology’s Abominable Mystery,” R. Joel Duff presents “a single challenge” to all flood geology models.<sup>1</sup> It is to explain the evidence of fossil succession and the distribution of spores and pollen in sedimentary rocks. While Darwin found the late and abrupt appearance of flowering plants to be an abominable mystery, Duff regards pollen evidence as “an even greater abominable mystery” that flood geologists still need to solve.<sup>2</sup> Some readers may view billions of years of evolution as the only viable alternative and conclude that the flood described in Genesis was either local or mythical. As explained below, there is another alternative untroubled by this challenge, and we can question which abominable mystery is actually the greater.

The article did not include a comparable examination of Darwin’s abominable mystery. Duff dismissed it as “no longer such a mystery” and claimed, “Standard geological and evolutionary theories provide a robust explanation for the succession of fossils in the geological column.”<sup>3</sup> We can hardly consider the older mystery solved if the reason that flowering plants appear in only the uppermost strata is that they evolved late and abruptly. Why late? Why abruptly? Why was the Cretaceous the right time for flowering plants to begin to flourish? Abruptness is the rule for all life forms, and this is abominable to those who believe in macroevolution because they need to find a glacially slow accumulation of beneficial mutations. This process is purely theoretical and has not been demonstrated through repeatable experiments. Duff did cite ongoing debate over details of angiosperm origins and evolution in his footnote 36, but this hardly explains why Darwin’s mystery can now be considered less abominable than the one that flood geologists face.<sup>4</sup> If an abominable mystery left unsolved requires theory revision or even rejection, then why should evolutionists get a pass but not flood geologists?

“Minimization of the miraculous,” an axiom Duff mentions in his first footnote, raises a key question. Apart from the work of “creation scientists,” has any reputable scientific investigation of origins or any past event ever led to a conclusion that a miracle took place? If the truth is that a miracle has occurred, we can know this by having

witnessed it personally or by believing the testimony of trustworthy witnesses, but this is not science. Scientists might be able to shed some light on the nature of a miracle, but they are almost sure to report that there was no miracle, so if the true solution to the abominable mystery now challenging flood geologists involves a miracle, it may never be found through purely scientific investigation.

Nevertheless, theories about the Genesis account of a great flood and other mysteries do attract great interest. According to a theory proposed by Gerald Aardsma, the flood was due to water from the southern oceans moving north to cover most of the northern hemisphere,<sup>5</sup> leaving some other areas dry (Antarctica, Australia, the southern parts of Africa and America, as well as northern lands at low latitudes or high altitudes). Aardsma believes the event was too tranquil to have deposited all the global sedimentary rock,<sup>6</sup> but the flooded populations were destroyed.<sup>7</sup> If he is right, the flood was neither local, nor mythical, nor quite universal. Duff's challenge to flood geologists does not apply to his theory.

Aardsma has had relatively little to say about events that might account for the thick sediments that are found worldwide. One can speculate that they are somehow related to the curse on the ground mentioned in Gen. 3:17, but the concise record of this curse in the Bible leaves much room for speculation. We rely on eyewitness testimony to study miracles. Scientific investigation can help only by suggesting limits to what may be considered a reasonable theory. Apart from the Bible, we have no way to know exactly what God did to curse the ground or what miracles may have been performed at that time.

We can all read Genesis or ignore it, but as we face these abominable mysteries, we can believe what we read there, or reject it, or invent figurative interpretations. I recommend belief.

## Notes

<sup>1</sup>R. Joel Duff, "Flood Geology's Abominable Mystery," *Perspectives on Science and Christian Faith* 60, no. 3 (2008): 168.

<sup>2</sup>*Ibid.*, 174.

<sup>3</sup>*Ibid.*, 174–5.

<sup>4</sup>The abruptness of the evolution of flowering plants is still recognized, and the cause of their diversification "remains mysterious," according to the news article, "Tree of Life for Flowering Plants Reveals Relationships Among Major Groups" at [www.utexas.edu/news/2007/11/27/biology\\_tree\\_of\\_life](http://www.utexas.edu/news/2007/11/27/biology_tree_of_life) (accessed October 23, 2008).

<sup>5</sup>Gerald E. Aardsma, "The Origin and Antiquity of the Biblical Text," *The Biblical Chronologist* 8, no. 6 (2002): 2–3. Nice supporting evidence is covered in an earlier article by Aardsma, "Noah's Flood: The Irish Evidence," *The Biblical Chronologist* 5, no. 3 (1999): 1–7. This flood theory was introduced to *PSCF* readers in my earlier letter, "On the Hills of Concordism and Creation Science," *Perspectives on Science and Christian Faith* 55, no. 4 (2003): 278, which was part of a longer discussion. See also, for instance, my later contribution, "Do Ice Cores Disprove Aardsma's Flood Theory?" *Perspectives on Science and Christian Faith* 56, no. 1 (2004): 76–7.

<sup>6</sup>Gerald E. Aardsma, "Research in Progress," *The Biblical Chronologist* 4, no. 1 (1998): 15–6.

<sup>7</sup>Gerald E. Aardsma, "The Depth of Noah's Flood," *The Biblical Chronologist* 3, no. 3 (1997): 9–10.

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## Not All Mysteries Are Equivalent

In his letter Thomas Godfrey suggests that my article on spores and pollen in the fossil record [*PSCF* 60, no. 3 (2008): 166–77], though it may represent a mystery to conventional flood geology theories, does not challenge all young-earth theories. One such theory has been promoted by Gerald Aardsma. His theory, I agree, does represent a radically different approach to the reinterpretation of the geological history of Earth from a young-earth paradigm. His theory, as I understand it, relies on the idea that there is a pre-creation virtual history.<sup>1</sup> While I have some difficulty distinguishing this virtual history from what is generally referred to as creation with the appearance of age, Aardsma does manage to avoid one serious complication that often confronts global flood proponents: if the world were created with apparent age, what then were the effects of the flood? Aardsma manages to skirt this difficulty by claiming, as Godfrey points out, that the biblical flood was not quite universal. By doing so, Aardsma posits that the vast majority of geological strata and fossils, including possibly even some human archeological remains, are part of our virtual history, albeit a virtual history reflective of a world inflicted by the curse. With this approach to Earth's history, Aardsma has clearly moved far from his flood geology roots and is now claiming that the histories, including presumably that of the spore and pollen record, which have been interpreted as long ages, may actually represent accurate interpretations of time, albeit a virtual time.

But what then of the origin of angiosperms? In reference to standard evolutionary theory, the mystery of flowering plant evolution is not so much a mystery in terms of whether it could happen, but rather a mystery in not knowing the details of how it happened. Even in Aardsma's virtual history, there would be evidence of an origin of angiosperms that would include an observable first appearance of angiosperm plants and their pollen and evidence of the proliferation of flowering plant groups over some period of virtual history. What then is accomplished by suggesting that this virtual history which God has provided for us should contain evidence that would make us doubt what he has made clear in other lineages; namely, that they have changed over time? Molecular genetics and many new fossil discoveries have provided evidence that the first flowering plants diversified over a short period of time.

There is, I agree, considerable evidence of abruptness in the fossil record. However, that abruptness, even in the case of angiosperms, may still represent millions of years of real or, in the case of Aardsma, "virtual" time. Exactly how such bursts of radiation occur is not completely understood, but that they do occur is not especially surprising nor mysterious, in the sense that promising hypotheses have not been proposed. Recent studies, such as those on cichlid fish,<sup>2</sup> have shed new light on the numerous patterns and mechanisms for rapid speciation and adaptive radiation. In the end, the challenge of the spore and pollen distribution does not rely on perfect knowledge of how angiosperms may or may not have evolved, but on the fact that they represent, at a minimum, a highly coordinated set of evidences of sequential stages of the origins of different organisms on Earth. Catastrophic flood geologists have not provided any

# Letters

coherent theory that can account for this highly detailed fossil record. They are left with a true mystery that can only be confronted with ad hoc explanations. The present understanding of conventional geology and evolutionary biology suggests that there is nothing implausible with the rapid and late diversification of angiosperms, and thus the mystery of the details of their origin is not one of inconceivability, but rather one of wonder.

## Notes

<sup>1</sup> Gerald E. Aardsma, "The Age of the Earth, Virtual History, and Hebrews 11:3," *The Biblical Chronologist* 8, no. 5 (2002): 1-3.

<sup>2</sup> Ole Seehausen, "African Cichlid Fish: A Model System in Adaptive Radiation Research," *Proceedings of the Royal Society B* 273 (2006): 1987-98.

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## Does Philosophy Justify ID?

Responding to Douglas Groothuis ("Intelligent Design and the State University: Accepting the Challenge," [*PSCF* 60, no. 4 (2008): 233-9]), Walter R. Thorson ("A Response to Douglas Groothuis" [*ibid.*, 240-7]), handles the scientific aspects. But there are still major problems with philosophical matters.

Groothuis zips past Gettier's objection to the ancient definition of knowledge as "justified, true belief" (pp. 233; 238, note 2), which unfortunately applies to his argument. Gettier presents a story of two applicants, Smith and Jones, waiting for the announcement that one has been chosen for a job.<sup>1</sup> The president of the company had told Smith that Jones would be hired and Smith has watched Jones nervously counting the coins in his pocket. On this basis, he deduces that the man who will get the job has ten coins in his pocket.

However, Smith neither knows that he also has ten coins in his pocket nor that he will actually get the job. Smith's conclusion, though true and believed with apparent justification to be true, was derived from false premises. Consequently, he cannot be said to have known it. Also, the change from specifying the individual by name to the more broadly descriptive "man who will get the job" takes away the specificity necessarily required.

Groothuis overlooks such a requirement in his statement that ID is "made up of scientists, philosophers, and others" (p. 234) who make certain claims. But what a philosopher states does not meet the requirement of strict truth justifying ID. The sole ultimate test for a philosophical system is logical consistency. Fully worked out, both philosophical systems and mathematical calculi are derived deductively from sets of axioms. Geometers may accept Euclidean, Riemannian, or Lobachevskian axioms and get some different incompatible theorems. Consequently, the truth of a theorem is conditional on the specific axioms which are assumed, not proved. Similarly, philosophers may accept axioms yielding materialistic, pantheistic, deistic, theistic, or other philosophical systems. Not all of these, as advanced by individuals, are

consistent, but I know of no demonstration that all but one are inconsistent. However, there is a strong tendency to declare one's own system right. A limitation of this approach is illustrated by the impossibility of disproving solipsism, which we all reject.

Adding an unproved philosophical view to the doing of science neither alters the practice of science nor makes its theories true. At most, ethics may proscribe some experiments, as may a lack of funding. It has been widely noted that the neo-atheistic declaration that science proves atheism is silly. The same unfortunately holds for claiming proof of a deistic, theistic or alternative designer from science. Adding philosophical assumptions or techniques to the current methodology of science does not qualify it as true. It merely makes the whole a mishmash of categories.

## Note

<sup>1</sup>Edmund L. Gettier, "Is Justified True Belief Knowledge?" *Analysis* 23 (1963): 121-3. Also at [www.ditext.com/gettier/gettier.html](http://www.ditext.com/gettier/gettier.html) (accessed December 29, 2008). I have modified the story.

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