The Proceedings of the International Conference on Creationism

Volume 7 Article 25

2013

What is the Eternal?

Steven M. Gollmer
Cedarville University

Proceedings of the Seventh International Conference on Creationism.
Pittsburgh, PA: Creation Science Fellowship

WHAT IS THE ETERNAL?

Steven M. Gollmer, Cedarville University, 251 N. Main St., Cedarville, OH 45314

KEYWORDS: Philosophy of science, worldview, cosmology, origin of universe, origin of life, materialism, theism

ABSTRACT

Apologetics arguments related to the creation account in Genesis have ranged from evidential proofs for a young creation to the presuppositional consistency of the biblical worldview. Each of these arguments has its place, but the effectiveness varies depending on the audience's background. A fundamental assumption for all arguments is that God exists and that he has purposefully communicated with his creation through special revelation. Those not holding this faith commitment resort to other answers that they feel are scientifically based. What they overlook are the faith commitments underlying their scientific answers. This paper poses the question "What is the Eternal?" to expose the faith basis for all answers related to origins issues.

For the purpose of this paper, the "Eternal" is defined to be that which is before all things and will persist after all other things are gone. It is the foundation or basis for all that is real. From the author's perspective there are five distinct responses to this question. All other possible responses are syntheses of these basic five.

1. This is a ridiculous question. This response denies the need to address first causes.
2. Everything came from nothing. This response is not an argument for ex nihilo creation, but for the spontaneous creation of the universe from nothingness.
3. The material universe is eternal. This response retains the foundations of atomism, but adds other assumptions to address the expansion of the universe.
4. The eternal is a metaphysical essence or cosmic consciousness. This response resorts to impersonal forces beyond the physical to explain the fine-tuning of the universe and the complexity of life.
5. The eternal is a self-existent, omnipotent, personal creator. This response corresponds to traditional theism and posits that the existence of the universe is the result of a purposeful choice of a Creator, who desires relationship with His creation.

The argument outlined in this paper has historical roots predating Paul's defense on Mar's Hill. The originality of this approach hopefully is in its ability to expose syncretic thinking in a culture that makes science the ultimate authority. Historically creationists have debated evolution using a two-model approach: theism vs. materialism. However, it is becoming clear to the author that metaphysical explanations appear with increasing frequency in scientific literature to skirt the philosophical and moral barrenness of materialism. Presenting an audience with the distinction

between “What is the Eternal” and “Who is the Eternal” will help them to respond to the One “to whom we must give account.” (Heb. 4:13)

INTRODUCTION

Mankind from ancient times has sought out the nature of reality. From Greeks, Egyptians, Norseman, to Indians there have been stories and myths to describe what is and how it came to be. In recent centuries the tools of modern science have expanded our understanding of the physical universe in unprecedented ways. These advances have led to an opinion (commonly accepted in the scientific community) that reality is embodied in the physical realm and, therefore, science is a partner if not a primary source for determining reality. This is clearly seen in the declarations of cosmologists over the past decades. Commenting on Membrane Theory, Hawking and Mlodinow (2010, p. 8) state

> According to M-theory, ours is not the only universe. Instead, M -theory predicts that a great many universes were created out of nothing. Their creation does not require the intervention of some supernatural being or god. Rather, these multiple universes arise naturally from physical law. They are a prediction of science.

In his recent book, A Universe from Nothing, Lawrence Krauss (2010, p. xiii) writes

> The answers that have been obtained – from staggeringly beautiful experimental observations, as well as from the theories that underlie much of modern physics – all suggest that getting something from nothing is not a problem. Indeed, something from nothing may have been required for the universe to come into being. Moreover, all signs suggest that this is how our universe could have arisen.

Although their claims are tied to physical observations, they are laden with a number of assumptions. Without evaluating these assumptions many have accepted the conclusions of these cosmologists as scientifically authoritative to the dismissal of religious or philosophical claims.

Our society places a high degree of confidence in science due to our technological advancements; however, when making claims about reality one must be careful to identify the limitations of science. Science is defined as a system of knowledge that can be tested against the physical universe. Without a methodology of verifying the legitimacy of claims one is left at the mercy of the most persuasive orator or the most convenient doctrine. A number of court cases in the United States have ruled against Creationism and Intelligent Design due to the scope and limitations of science. On page 66 of the Kitzmiller v. Dover Area School District (2005) court ruling, the following statement is made with regard to the nature of science.

> Science is a particular way of knowing about the world. In science, explanations are restricted to those that can be inferred from the confirmable data – the results obtained through observations and experiments that can be substantiated by other scientists. Anything that can be observed or measured is amenable to scientific investigation. Explanations that cannot be based upon empirical evidence are not part of science.

Cosmological models are used to make claims of the existence of higher dimensionality and multiverses. Abiogenesis scenarios are purported as the most likely means by which life arose in the universe. Within decades computer capabilities will match that of humans and may achieve the status of a conscious mind. Based on the criterion of the Kitzmiller case are these statements of science or predictions of a worldview laden with unverifiable assumptions?

Philosophy of science

What has blurred the line between philosophy and science over the past century is the accelerating pace of discovery. Karl Popper (1963) proposed falsifiability as a basic criterion for an acceptable scientific theory. However, Thomas Kuhn (1962) challenged the positivist view of science by stating that it consists of paradigm shifts, which provide a context for acceptable scientific questions and conclusions. Discounting theologians and philosophers, Krauss (2012, pp. xiii-xiv) defends his proposal of a universe from nothing by saying

> But therein, in my opinion, lies the intellectual bankruptcy of much of theology and some of modern philosophy. For surely "nothing" is every bit as physical as "something," especially if it is to be defined as the "absence of something." It then behooves us to understand precisely the physical nature of both of these quantities. And without science, any definition is just words.

Krauss implies that, given the pace and technical expertise required for scientific discovery, philosophy cannot keep pace and, therefore, science is the means of defining reality. Ultimately science is conducted with an assumption that there is a discoverable, underlying, pervasive, lawful foundation of reality. Whether this foundation is comprehensive or a subset of total reality is open to debate. What has become clear upon reflection on the past century of scientific discovery is that describing reality from the first principles of physics may in theory be possible, but is impossible in practice. This notion is captured by Martin Rees' (1998, pp. 161-2) quote

> Nor would a fundamental theory help us to untangle the complexities of later cosmic evolution. We may be reductionists, believing that the complexities of chemistry and biology are in principle reducible to physics, and that even the most elaborate assemblages of atoms are governed by Schrodinger's equation. But that equation cannot in practice be solved for anything more complicated than a single molecule. The sciences are in a hierarchy of complexity, from particle physics, through chemistry and cell biology, to psychology and ecology. But each of these sciences is autonomous, in that it depends on its own set of concepts that can't be analyzed into anything simpler.

Since our perception of reality is limited, and the discoveries in some fields of science are counter-intuitive, Stephen Hawking and Leonard Mlodinow (2010, p. 32) resort to the concept of "effective theories of reality," which they describe as "a framework created to model certain observed phenomena without describing in detail all of the underlying processes." This approach is reasonable to most, but they go one step further and adopt what they describe as a "model-dependent" view of reality. In this view of reality, life and mind 'appear' to be

ontological in nature; however, they are constructs of a limited intelligence trying to make sense of complex manifestations of purely physical processes.

If Hawking and Mlodinow are correct, then all of existence reduces to an elaborate game of physics. Using Feynman's analogy of physics as a game of chess (Darling, 1989, pp. 26-7), the laws of physics describe the board and the permitted movement of the pieces. Strategies arise from complex sequences of moves and are abstractions that only appear to be independent of the fundamental rules of the game. By analogy chemistry, biology and cognitive science are those abstractions, but ultimately they are constrained to the physicality of the universe. However, in a game, strategies have value because they demonstrate progression towards an end game, checkmate. Do the strategies of the physical universe also point to a final purpose (Aristotle, 2007, Book II) or are the disciplines of science just curiosities constructed by finite minds in a purposeless universe?

Impact of one's view of reality and philosophy

What one believes about reality significantly impacts his decisions about the present (ethics) and opinions about the future (destiny). If the universe is the product of chance, then life's choices are biased towards immediate and personal benefit. Destiny is what one makes of his life rather than finding one's role in the grand purpose of the universe. This impacts not only individuals, but societies. The value of life, stewardship of environment and role of scientific discovery hinges on concepts and beliefs beyond the reach of scientific investigation. What someone believes is the true nature of reality is reflected in how he answers the following questions. Is man merely a product of his genetics and environment? Is life an accident or the destined outcome of physical laws? Is this universe one of many or a single entity with properties unique for the existence of life? Is man a reflective, independent, self-aware agent or is this an illusion of complex physical interactions?

Many camps of philosophy have arisen to address the nature of reality from objective realism to non-realist positions of experimentalism and phenomenalism. (Moreland, 1989) The subtleties of these positions, although important for philosophical discourse, are often ignored or misunderstood by scientists and lay audiences. Conflating issues of significant observables, physical limitations to accurate measurement and conceptual complexity beyond the limits of finite minds makes it difficult to sort out the role that science plays in understanding reality. Because of this confusion it often happens that syncretic arguments for the nature of reality are presented, using a diverse and sometimes incompatible litany of arguments to prove one's beliefs. Lisle's book *The Ultimate Proof* addresses this issue by stating "If a worldview has internal contradictions, then it cannot be correct since contradictions cannot be true." (Lisle, 2009, p. 37) He goes on to say "Apart from biblical creation, there just isn't any reason to think that our senses and perceptions of the world are reliable." (Lisle, 2009, p. 93) While this statement is affective at an emotional level, it is seen as an over simplification of the naturalist position and, therefore, does not gain traction with a scientific audience. The Intelligent Design movement has approached the issue from a self-declared scientific approach by asking the question, "Is there evidence for the existence of an intelligent designer?" If one presupposes the existence of a designer, the evidence is overwhelming. However, to the atheist or agnostic who

does not presuppose a designer, the "God Hypothesis" is seen as an unnecessarily complex proposition to explain phenomena that can be described by physical causation.

Anthropic principle with respect to life and mind

Although a phenomenon may have a mechanistic description, that description does not necessitate a particular worldview or means of causation. It is presumed that cosmology is simple enough to determine the history of the universe from Big Bang to Big Freeze. However, when considering the nature of life and mind, the proposition is not so simple. Not only is life so complex that it cannot be reproduced *de novo* in the laboratory, but the physical properties of the universe are so uniquely suited for the existence of life that the probability of this happening by chance is beyond belief. In light of the uniqueness of life and mind, Brandon Carter (1974) articulated two forms of the Anthropic Principle. The 'weak' anthropic principle relies on a selection rule which limits conscious observers to universes with the right conditions. Therefore, the improbability of our universe is reduced to 100% certainty since we are alive to ponder the question. The 'strong' anthropic principle goes a step further by stating that if the conditions are right for life to form, it will. Although scientists are unable to create living organisms, given enough time under the right conditions in a suitable universe, "life will find a way." A similar approach is used to explain the conscious mind with hopes that computer intelligence will match and transcend human intelligence in the near future. (Kurtzweil, 2006)

No matter how attractive these proposals may be, they are based on unverifiable assumptions. Barrow and Tipler (2009, p. 22) identify three possible interpretations of the strong anthropic principle:

> (A) There exists one possible Universe 'designed' with the goal of generating and sustaining 'observers.'…
> (B) Observers are necessary to bring the Universe into being….
> (C) An ensemble of other different universes is necessary for the existence of our Universe.

They reject the first position because it is not "open to proof or to disproof." However, the other two have physical value because they either provide "a satisfactory interpretation to quantum mechanics" or are "potentially testable." The fallacy of this conclusion is that none of the three are "open to proof or to disproof." Once each of these positions is chosen, testable physical consequences are hypothesized. However, only the consequence can be tested and, therefore, proven. If disproven, the consequence is rejected and a new conjecture is proposed based on the presupposed position.

To broaden Barrow and Tipler's approach by including the weak anthropic principle and emphasizing the untestable nature of one's position, the question "What is the Eternal?" is proposed. This question appears to be laden with religious implications; however the purpose of this question is to expose one's view of the self-existent foundation of reality. Self-existence is associated with the Creator described in the Bible and often criticized by asking "What did the creator do before he made our Universe?" However, when this question is asked, the skeptic seldom feels compelled to answer what his concept of the eternal or foundation of reality is.

Some Greek philosophers associated the eternal with an impersonal uncaused cause or demiurge from which the physical realm was created. In Buddhism there is a singular, self-existent unity from which all reality is derived. In many origin myths references are made to nothingness, void or chaos from which the order of the physical realm arose. The entities that brought about this order are described as self-creating or self-existent in a similar way to the Christian's view of God. The notion of the "Eternal" is pervasive and essential to understanding the nature of reality. How one answers the question "What is the Eternal?" has an impact on his understanding of the origin of the universe, life, consciousness, purpose and destiny.

Premise: What is the Eternal

For the context of this paper the "Eternal" is defined to be that which is before all things and will persist after all other things are gone. It is the foundation or basis for all that is real. From the author's perspective there are five distinct responses to the question "What is the Eternal?" (WITE) All other possible responses are syntheses of these basic five. The responses are as follows: 1) This is a ridiculous question. 2) Everything came from nothing. 3) The material universe is eternal. 4) The eternal is a metaphysical essence or cosmic consciousness. 5) The eternal is a self-existent, omnipotent, personal creator. Although the primary discussion will focus on the origin of the matter/energy of the known universe, a discussion of reality is not complete unless it includes the origin of life, mind/consciousness, physical/mathematical laws, morality and other topics of interest to theologians and philosophers. These additional concepts are sprinkled through the discussion to illustrate the consequences of one's view of WITE. The primary purpose of this paper is not to provide a polemic to demonstrate the superiority of one answer over another, although the author feels the fifth one does meet that criterion. However, the purpose is to present each answer to WITE as described in popular scientific literature and other sources. Once each answer is described, concluding remarks are made with regard to the relationship between WITE and scientific investigation and the implications of WITE to reality. This presentation is not comprehensive, but should be sufficient to conclude that the answer to WITE is not a scientific answer, but is an untestable assumption accepted by faith.

RIDICULOUS QUESTION

Time connected to space

The beginning of time is a difficult notion. Through a natural progression of cause and effect we want to question "What was before that?" As a result, one critiques the existence of a creator by asking, "Who made God?" or "What did He do before He created the Universe?" Augustine's response to this critique is that the question implies a false notion of time. (City of God, Book 12 Chapter 15) Time does not exist apart from the Universe and, therefore, questions about time become paradoxical when applied to the eternal, self-existent God. A variant of this argument is used by Stephen Hawking (1988) to demonstrate the absurdity of trying to explaining the cause of the Big Bang.

Our current understanding of General Relativity states that space and time are inter-related. Measurement of the Doppler shift for distant galaxies implies our Universe is expanding and the rate of expansion is quantified in the Hubble constant. If this expansion is extrapolated

backwards, there is a beginning of time when all of the mass/energy of the universe exists at a single point called a singularity. "At the singularity, general relativity and all other physical laws would break down…. Space-time would have a boundary – a beginning at the big bang." (Hawking, 1988, p. 122)

Hawking goes on to argue that the history of the Universe can be likened to a four-dimensional sphere where the North Pole corresponds to the big bang and the South Pole the eventual collapse of our Universe into a singularity. (The collapse of the universe only applies to some cosmology models.) To ask "What was before the big bang?" is equivalent to asking "What is north of the North Pole?" The question has no meaning because time does not exist apart from the existence of space.

Singularities are problematic in mathematics which in turn makes a physical description of the beginning of our Universe difficult. To circumvent the singularity two approaches are applied. The first is to define the four-dimensional universe in terms of complex numbers. Instead of a singularity the beginning of the universe is mapped to a smooth function that allows the properties of space/time to be explored. Although the observable portion of the universe corresponds to the real portion of the complex number, the imaginary portion is equally valuable in the mathematical relationship. If this mathematical construct is foundational to reality, then we are missing a significant portion of what is "real" due to the limitations of our perceptions. From this perspective it is reasonable to conclude that our understanding of the universe is at best an "effective theory" or a "model dependent realism." This is in sharp contrast to a "rational realist" perspective on the history of science, where scientific theories are able to make verifiable existence claims. (Moreland, 1989)

An alternate approach to dealing with the singularity at the beginning of time is to remap it using a logarithmic function. The logarithm approaches infinity at large numbers, but approaches negative infinity at zero. Heinz von Foerster used this approach to spread out the large number of events occurring at the beginning of the universe and to compress the representation of future events spread over large eons of time. (Franchi *et al*., 1997) Although this method eliminates a finite beginning of the universe, it is merely a convention, which does not match our perception of time nor the mathematical relationships used to describe motion within the universe.

Not a consistent basis for origin of life and mind

Extending this argument for the origin of our Universe to the origin of life and mind becomes problematic. This argument would imply that it is ridiculous to study the notion of life before life began. Extrapolating biological principles backwards to the first life may be possible, but one cannot make a biological argument for the initiation of the first life. Using an assumption that life is an epiphenomenon of physical laws, abiogenesis scenarios are proposed. However, this presupposes a materialist basis of all reality, which is beyond the scope of this response to WITE. In like manner one should conclude that it is ridiculous to study the existence of mind before mind exists. Theories of proto-life and proto-mind may be used to frame the context of scientific investigation, but these pursuits will only reveal necessary, but not sufficient conditions for these qualities to be manifest.

The scientific implications of this response to WITE is that time has no meaning before the beginning of the universe. Therefore, science must be agnostic with regard to WITE. In a sense this is a safe answer to WITE because it delineates the limits of scientific investigation. However, this answer is unsatisfying because it puts the origin of the universe beyond the scope of science, which is also true of creationism.

It is also unsatisfying because it only limits and does not affirm a positive basis for reality. In the absence of a coherent worldview one must trust in the reliability of observation and rational thought. Ultimately a person can only trust in his own experiences (solipsism), but when extended to all of human experience still leads to an anthropomorphic reality. All of reality is embodied in effective theories, which ultimately lie in man's limited perceptions of the universe.

NOTHINGNESS

A second response to WITE is that everything came from nothing. This view is not new, but is reiterated by origin myths around the globe. Absolute nothingness is the absence of everything: space, matter, energy and laws. However, this idealized notion is never realized and a pragmatic perspective of nothingness becomes the absence of the substance of everyday experience. As an example, the Gylfaginning describes the beginning as follows:

> In the beginning
> not anything existed,
> there was no sand nor sea
> nor cooling waves;
> earth was unknown
> and heaven above
> only Ginungagap (open void)
> was --- there was no grass. (Sturluson, 1954, p. 32)

The story continues to explain how a frost ogre, cow and the first gods came to exist from the temperate regions between extreme cold and heat in the Ginungagap. The ogre was slain and became the earth. A similar approach exists in Greek mythology where the void is a realm of chaos from which all order appears. The most recent rendition of this story is embodied in Lawrence Krauss' *A Universe from Nothing*. Krauss' nothingness is a cosmic substratum from which our Universe and possibly others have spontaneously appeared without violating the first law of thermodynamics (conservation of energy), Newtonian mechanics, relativity theory and quantum mechanics. What makes this presentation attractive is the scientific framework from which it is presented.

A universe with zero net energy

The heart of the argument for a universe from nothing lies in a universe with a net mass/energy content of zero. The case is initially made using Newton's universal law of gravitation. Gravitational potential energy is defined as zero when two objects are an infinite distance away from each other. As a result, potential energy becomes negative for all finite distances. The increase of negative potential energy results in other forms of energy: kinetic and

electromagnetic. Therefore, the initial energy of the universe could have been zero. However, this does not account for the initial rest-mass energy of the matter composing the universe. Since mass/energy is conserved in the universe, it is a simple mathematical operation to introduce an offset in the potential energy function so the final answer is zero.

Relativity theory has a complementary method of confirming that the mass/energy content of the universe is zero. According to Einstein's theory of General Relativity, mass/energy results in the curvature of space/time. Locally this relationship manifests itself in gravitational lensing where the gravitational effect of an intervening galaxy can magnify the light of more distant galaxies. On the global scale a universe with more kinetic energy than gravitational negative energy will expand forever giving an 'open universe.' If the opposite occurs, (the conditions for a 'closed universe') gravity will ultimately stop expansion resulting in a final collapse of the universe. If the two forms of energy are in balance, then the universe is 'flat' and will expand indefinitely with decreasing kinetic energy until all matter is spread infinitesimally thin. Measurements from the Boomerang Experiment and the Wilkinson Microwave Anisotropy Probe confirm that the universe is 'flat' or nearly so. (Krauss, 2012) Therefore, the total energy of our universe is zero, or nearly so.

Heisenberg uncertainty and spontaneous formation

From the early days of particle physics it was observed that energy could produce matter/antimatter pairs and the annihilation of these pairs convert mass back into energy. In addition the particle/wave duality of the subatomic world limits the precision of determining energy conservation. Therefore, it is possible to measure violations of the first law for short periods of time as defined by Heisenberg's Uncertainty principle, $\Delta E \Delta t \geq \hbar/2$. Whether this is a statistical limitation of measurement or an inherent limitation to energy conservation, there is now a possibility of forming a zero-energy universe from the quantum mechanical fluctuations of a cosmic substratum.

The cosmic substratum is different than the space/time of our Universe because we don't observe the spontaneous appearance of macroscopic objects. This problem is commonly called the Boltzmann Brain Paradox, which states that it is more likely for a fully functional brain to spontaneously appear than our low entropy universe. Krauss affirms the unstable nature of the substratum by stating

> The lesson is clear: quantum gravity not only appears to allow universes to be created from nothing – meaning, in this case, I emphasize, the absence of space and time – it may require them. 'Nothing' – in this case no space, no time, no anything! – is unstable. (Krauss, 2012, p. 169-70)

The difference between our Universe and the substratum lies in the fact that once space/time exists, the presence of gravity prevents additional spontaneous appearances. If additional appearances occur, they would introduce a net positive energy into our Universe, which would violate the first law of thermodynamics. Therefore, our Universe is stable.

To complete the picture and to address the Horizon and Flatness Problems of Big Bang cosmology, an inflationary event is invoked 10^{-32} seconds after the beginning of our Universe. (Guth, 1997) Although a quantum fluctuation may have initiated our Universe, it was equally likely to disappear. However, if the appearance of space/time initiates a phase change (symmetry break) in the substratum, inflationary energy is introduced into our Universe as the volume of our space moves from a "false vacuum" to the current vacuum of empty space. This rapid inflationary event allows vast regions of our observable universe to be causally connected and to approach the flatness condition of zero net energy. Continued expansion of the universe introduces additional energy due to the vacuum energy of space and is identified as the cosmological constant (a form of dark energy).

Spontaneous formation of life and mind

In like fashion this approach is used to explain the existence of life and mind. Life is treated as a property or dynamic quality that arises from a physical substratum. In a biological sense, life comes from nothing that is biological in nature. Life spontaneously arises from the unstable, non-equilibrium state of the physical universe. Likewise mind arises from the dynamic complexity of a biological substratum. Therefore, mind is contingent on biology, which is contingent on the physical, which is ultimately contingent on the unstable, inflationary, cosmic substratum. By a similar argument, if life and mind are epiphenomena of the physical, then our Universe is an epiphenomenon of the cosmic substratum.

This causal explanation for a universe from nothing implies that there is a cosmic substratum beyond our observable Universe that provides the basis for the existence of space/time and the source for its mass/energy. Nothingness cannot be measured scientifically and is only an axiomatic assumption from which to propose scientific questions. Scientific discovery may change one's view of how nothingness impacts our Universe; however, this assumption can be held no matter the outcome of the investigation. If claims are made that nothingness can be examined scientifically, then nothingness must be an eternal phenomenon that manifests itself in our Universe. Therefore, this phenomenon is not truly nothing, but can be better addressed by the other responses to the question WITE.

Summary

In summary this response to WITE makes the following claim: Everything comes from nothing. However this nothingness is a cosmic substratum with properties and laws at least in part different than those observed in our Universe. This response hales from the earliest days of human history and is given an updated scientific façade. Some may question the improbability of this proposition and when talking about the inflationary scenario, even Krauss (2012, p. 98) states "This is so strikingly non-intuitive that it can seem almost magical." However, he later assures us that "Our universe is so vast that, as I have emphasized, something that is not impossible is virtually guaranteed to occur somewhere within it. Rare events happen all the time." (Krauss, 2012, p. 126) Improbability does not disqualify a response to WITE; however, it does illustrate the faith rather than scientific basis of this proposition.

THE MATERIAL ETERNAL

The third response to WITE is a material universe. With roots in both Greece and India, this position has been influential for two and a half millennia. Scientists adhering to this response are called atomists, who feel our Universe consists of indivisible eternal particles that are surrounded by void. With the advancement of science atoms are no longer considered indivisible and the void is filled with fields that moderate the interaction between particles. Atoms are not eternal, but are composed of subatomic particles, which can be created or annihilated under the right conditions. This may seem to undermine the doctrine of atomism; however, conservation principles put restrictions on what can happen and provides a basis for adhering to a material universe.

Until the 1930's most cosmologists assumed that the material universe was eternal and in a dynamic steady state. Apart from Olber's paradox this paradigm remained unchallenged as knowledge of our Universe progressed from a geocentric solar system surrounded by stars to billions of galaxies extending to the furthest reaches observed by our most powerful telescopes. However, work done by Hubble provided compelling evidence that at the intergalactic-scale space is expanding. Extrapolating this expansion backwards in time implies a beginning and thus a non-eternal material universe. Unwilling to accept Big Bang cosmology, Fred Hoyle became the most ardent champion of maintaining a conventional view of an eternal material universe. His last publication promoted a Quasi Steady State (QSS) universe in which continuous creation of matter occurs in the void left by an expanding universe. (Hoyle, Burbidge & Narlikar, 2000) Although the QSS model is dismissed as inferior to the inflationary Big Bang model, the addition of 'dark energy' through inflation is not much different than the concept of continuous creation.

A mechanistic substrate of our Universe

In spite of a finite beginning to the material universe, materialistic principles provide a basis for most of the theorizing about the origin of our Universe. Although some may deflect the question as ridiculous and other inure that everything comes from nothing, most often they adhere to an eternal physical entity that can be studied scientifically. As discussed previously, the physical entity must be a cosmic substratum similar enough to our Universe to allow us to adequately hypothesize, model and test the properties of the substratum. Since the substratum cannot be tested directly, a number of candidates have been proposed and justified on scientific grounds.

The properties of the substratum give rise to the physical laws of our Universe. Therefore, a comprehensive theory of physics is essential to narrow down the proposed cosmological models. Central to a comprehensive theory is the unification of quantum mechanics and general relativity. Most approaches propose a form of quantum gravity, where relativity theory is recast as a quantum phenomenon, thus resulting in gravitons. Although gravitons are a testable prediction of these theories, in practice detection of such particles is theorized to be exceedingly rare. Testability of these models is equally elusive due to the global nature of their predictions. Therefore, a large number of competing models have been proposed.

Implications and scientific merit of these models have been explored in a number of populist books. With varying degrees of vibrato these books have captured the imaginations of their

audience. As mentioned before, Krauss (2012) proposes a universe from nothing; however, he ultimately sides with a model named Eternal Inflation, proposed by Linde and Vilenkin, in which non-interacting universes spontaneously appear from the false vacuum of the substratum. Although time as we know it only exists in our Universe, this process continues eternally generating all possible combinations of existence. To keep the combinations from being arbitrary it is proposed that different universes have properties linked to the Higg's field, which is associated with the particle recently confirmed at CERN. (Greene, 2011) If a universe can appear from the substratum, then a further decrease in the vacuum energy may allow for baby universes to appear within parent universes. This can lead to a Darwinian progression from least fit to more fit universes. (Smolin, 1997)

Not only do these models propose an infinite number of universes, which are causally disconnected from our own (Gribbon, 2010), but many also propose a higher dimensionality than observed in our experience with space/time. Resorting to ten and even up to 26 dimensions, string theory allows the variety of particles observed through experimental physics to be explained by a collection of identical fundamental entities interacting with the higher dimensions of space/time. (Greene, 1999) How these dimensions interact with each other provide up to 10^{500} different forms, one of which corresponds to our universe. (Greene, 2011, p. 145) The possibilities need not be restricted to one-dimensional strings, but can include N-dimensional structures called branes, upon which the strings interact. Steinhardt and others propose that the beginning of our Universe may have been the result of colliding branes. (Green, 2011, p. 137) Surprisingly, higher dimensions may not be needed since all of the information of our Universe can be contained on its bounding surface. 't Hooft and Susskind propose a holographic principle in which the processes that determine what we call reality occur on the bounding surface rather than the three-dimensional space of our Universe. (Smolin, 2001)

The source of life and mind

Given the vast array of models, the potential of higher dimensions and unlimited resources of infinite multiverses, the possibility of life and mind in a material universe appears to be a certainty. The weak form of the anthropic principle is satisfactory since the improbability of $1{:}10^{150}$ as proposed by Dembski (1998, p. 209) is equally met by the unlimited resources of the cosmic substratum. Susskind (2005) would agree that our Universe is uniquely suited for life; however, it is not due to design, but selection bias: If the conditions were not right, we would not be here to consider the improbability.

However, a universe with the right properties for life does not necessitate the existence of life. It is assumed, if physical processes sustain the mechanisms and reproduction of life, then those same processes can generate the mechanisms of life *de novo*. This notion is not new, but was addressed by Paley (1802) over 200 years ago. In the subsequent centuries the design of life has progressed from a Lego block mentality of assembling cells to the intricate interdependence of specialized components surpassing the complexity of current day computers. This understanding of biological and let alone cognitive science lead many to side with Hoyle (1983) in saying that it is more likely for a tornado to assemble a 747 in a junkyard.

In the name of science abiogenesis scenarios are proposed to span the gap between simple random occurrences and reproducible machines by the non-equilibrium thermodynamic states of hot and cold. Although the front-runner, RNA World, highlights unique catalytic properties of these molecules, the progression from simple replicators to the simplest functional cell is Herculean in nature and testable only in principle. Adherence to the notion of abiogenesis is not based on scientific merit, but by a philosophical commitment to materialism. This is clearly articulated by George Wald (1954, p. 46) when he reflects on Pasture's experiments which confirmed "germ theory," to the undermining of spontaneous generation.

> The reasonable view was to believe in spontaneous generation; the only alternative, to believe in a single, primary act of supernatural creation. There is no third position. For this reason many scientists a century ago chose to regard the belief in spontaneous generation as a 'philosophical necessity.'…One has only to contemplate the magnitude of this task to concede that the spontaneous generation of a living organism is impossible. Yet here we are --- as a result, I believe, of spontaneous generation.

In like manner proposals of higher dimensions and multiple universes are in principle testable, but are scenarios proposed from a commitment to philosophical materialism. When referring to string theory model building, Greene (2011, p. 186) states "Those who lead this charge combine the best of rigorous science with an artistic sensibility." Since the possible different universes extend to 10^{500}, the artist has a nearly infinite palate from which to build his world. The hope is that large categories of these universes can be eliminated through inconsistency arguments; however, a failure to find a suitable universe for life will not disprove the existence of an eternal material universe, but will result in a modified version of string or quantum gravity theory.

Summary

In summary this response to WITE claims that reality consists of eternal physical substances and processes, which may be dramatically different than what we measure in our Universe. A conservative approach to investigating the eternal is to assume the simplest conditions necessary for generating our Universe. As inconsistencies are observed, factors are added, such as exotic dark matter, dark energy, inflaton field, strings, branes, higher dimensions and multiverses. This approach does not invalidate the existence of these factors; however, it demonstrates the methodology of a fledgling science with limited data. Although some will take offence with this statement, mankind may look back on this era of unprecedented discovery and minimize its significance as we do Ptolemy and Aristotle. Krauss (2012, p. 139) lauds the accomplishments of the past century and feels it is "a disservice to all the brilliant and brave individuals who helped us reach our current state of knowledge" to believe in a "vague creative force or to a creator who is, by definition, forever unfathomable." However, it is just as much of a disservice to science to preclude these beliefs by exclusively promoting the faith statement that an eternal material universe self-creates complexity from simple stochastic processes.

THE METAPHYSICAL ETERNAL

A fourth response to WITE is a metaphysical essence. Perspectives of this essence can range from a variation on the substratum of the material eternal to a pervasive life force that responds

to the trained mystic. Plato's dialogue Timaeus uses the term "demiourgos" or demiurge to describe the fashioner or shaper of the material world. Aristotle when addressing the fourth or "final" cause described an "entelechy" as directing the physical towards some final state, not as "a mechanical force but a personalistic striving." (Pearcey and Thaxton, 1994, p. 52) This striving may impose itself on our Universe as we reside within it (panentheism) or may arise from inherent properties of the smallest particles (vitalism). In the Hindu tradition, the physical universe goes through an eternal cycle of destruction and recreation, but Vishnu is Absolute. The supreme essence or being is the source of all existence and the goal of life is to achieve union with the Supreme Being as in Buddhism. Although these views are discarded by modern scientists as unproductive and misleading, notions of eastern religion and philosophy permeate at a subliminal level. Chaotic dynamics and self-organization theories are used to explain the improbable origin of mind, life and even our Universe; and at the same time demonstrate that Greek vitalism is alive and well.

Strong anthropic ordering principles

In the previous response to WITE the "fine-tuned" properties of our Universe, although unlikely, are explained away as the outcome of a weak-anthropic selection rule. However, this response to WITE conveys that the selection rules are more directive than random, which leads to the strong anthropic principle. Instead of life and mind being the accidental outcome of a material universe, they become the inevitable outcomes of selection rules operating in non-equilibrium environments. These principles are overlooked because modern science has taken a reductionist approach and is only recently appreciating the significance of ordering principles present in dynamic complex systems.

Although dependent on the physical laws of our Universe, these ordering principles transcend the laws of physics because they are lost when particles or objects are studied in isolation. Harold Morowitz (2002) likens these selection rules to the Pauli Exclusion Principle of atoms. Although this principle is due to an inherent property of fermions and quantum mechanical interactions, the outcome is a reduced set of possible chemical reactions between limited numbers of unique elements. When taken further, it leads to the explosive variety present in organic chemistry and the appropriate bond strengths for primary, secondary and tertiary structures, which are necessary for the complexity of life. These ordering principles emerge from the interaction of particles like strategies of a chess game and, therefore, should be studied on their own right.

General Systems Theory was developed by Ludwig Von Bertalanffy (1969, p. 32), who describes it as "… a theory, not of systems of a more or less special kind, but of universal principles applying to systems in general." These principles are applied to economics, political science, biology, engineering, cognitive science and abiogenesis. A significant locus of research for applications of systems theory is coordinated through the Santa Fe Institute. The study of emergent properties and adaptive patterns in complex systems is best accomplished through computer simulations, where small variations can lead to dynamically different behavior. The subtle nature of these rules leads some to conclude that they are an epiphenomenon of the system; however, others feel they are ontological and will appear in any system with a sufficient amount of dynamic complexity.

The study of Chaos Theory and non-linear dynamics exploded with the advent of inexpensive computing power. One goal of research in this area is to define the basins of strange attractors. Through iterative calculation, these attractors keep certain regions of mathematical space connected to each other like gravity holding a planet in orbit. The regions can have non-intuitive and sometimes artistic appearances, and, therefore, provide a possible rational for emergent selection rules. Kauffman in his book *Investigations* proposes a fourth law of thermodynamics whereby a system in non-equilibrium will generate order. He describes his law as follows:

> As an average trend, biospheres and the universe create novelty and diversity as fast as they can manage to do so without destroying the accumulated propagating organization that is the basis and nexus from which further novelty is discovered and incorporated into the propagating organization. (Kauffman, 2000, p. 85)

Although this is described as a purely physical process, there is an assumption that the attractors of the non-equilibrium systems will maintain and not "destroy the accumulated propagating organization" that is needed to generate additional complexity.

Dembski responds to Kauffman's fourth law as a mechanism for getting order for free. He concludes

> … it was thought that because the Darwinian mechanism could account for all of biological complexity, evolutionary algorithms must be universal problem solvers. The No Free Lunch theorems show that evolutionary algorithms, apart from careful fine-tuning by a programmer, are no better than blind search and thus no better than pure chance. (No Free Lunch, p. 212)

What is thought to be a means of generating complex systems within fine-tuned universes is no better than a chance universe having the right properties for life. If the strong anthropic principle is true and life and mind can emerge from the physical principles fixed at the beginning of time, then the improbability of our Universe is rarer than the 10^{500} possibilities granted by string theory.

Our Universe depends on life and mind

The concept of emergence is often invoked to explain the origin of life and mind. However, a suitable universe as just mentioned is exceedingly rare unless it too can self-organize. Smolin's proposal of universes spawning baby universes through a form of cosmic Darwinian theory is one such possibility. (Smolin, 1997) Smolin studied a theoretical connection between the age of a universe and the number of black holes it generates. If baby universes have properties close to their parents, then eventually one lineage of universes will provide a universe with the appropriate conditions for life. Gardner (2003) takes this process one step further and proposes that once intelligence exists in a universe, upon achieving sufficient technology it could spawn baby universes with the right properties for life. This hypothesis allows an infinite regress of intelligence bearing universes through eternity. Gardner rejects supernatural scenarios as being unscientific, but claims "The Selfish Biocosm, while obviously speculative, can qualify as a genuine scientific hypothesis (as opposed to a metaphysical speculation) only if it yields

falsifiable predictions." (Gardner, 2003, p. 257) Gardner then proposes two tests, which in principle could falsify the hypothesis, but practically will remain inconclusive. This is no different than a number of tests for the existence of multiple universes or for a universe from nothing.

An alternate approach to the fitness of our universe is built on what Greene (2011) calls a Quantum Multiverse. Using John Wheeler's (1998, p. 340) idea that "information is at the core of physics," the Participatory Universe states that the essence of reality is information. The foundation of the Participatory Universe is stated as follows:

> 'It from bit' symbolizes the idea that every item of the physical worlds has at bottom – a very deep down, in most instances – an immaterial source and explanation; that which we call reality arises in the last analysis from the posing of yes-no questions and the registering of equipment-evoked responses; in short, that all things physical are information-theoretic in origin and that is a participatory universe. (Wheeler, 1990, p. 5)

Paired with the Copenhagen interpretation of quantum mechanics (all possible wave functions exist until an observation is made) our Universe is the result of self-observation. Just as Schrodinger's cat is both dead and alive until an observation is made, so our universe consists of all possibilities. Only those universes consistent with conscious observers come into existence, while all others remain unrealized.

The Quantum Multiverse explains the existence of not only our perceived Universe, but provides an infinite number of parallel universes in which all possible outcomes of our choices and actions are actualized. First proposed by Everett (Greene, 2011), this interpretation resolves the problem of why one outcome of an experiment is realized and another is not. All outcomes are actualized; however, realization of an outcome causes the wave function to lose coherence and reality becomes causally disconnected from other parallel universes. If this interpretation of WITE is true, then the eternal is a probability wave function that develops in a deterministic fashion from Schrodinger's Equation. Other authors push this concept further to question the physical basis of reality.

In *The End of Time*, Barbour (1999) proposes that time does not exist, but is an illusion as we observe changes in patterns from what we call "Now." Lanza and Berman (2009) take this same position and explicitly state that consciousness is at the core of reality and space/time are brought into existence as perceptions of this consciousness. Although Hawking and Mlodinow (2010, p. 140) would not agree with Lanza and Berman, it is interesting when they say,

> This leads to a radically different view of cosmology, and the relation between cause and effect. The histories that contribute to the Feynman sum don't have an independent existence, but depend on what is being measured. We create history by our observation, rather than history creating us.

Science in a metaphysical world

What impact does a metaphysical essence have on the role of science? By definition it is beyond the observable physical universe. This becomes problematic in light of Simpson's (1949, p. 127) statement:

> The most successful scientific investigation has generally involved treating phenomena *as if* they were purely materialistic, rejecting any metaphysical hypothesis as long as a physical hypothesis seems possible. The method works. The restriction is necessary because science is confined to physical means of investigation and so it would stultify its own efforts to postulate that its subject is not physical and so not susceptible to its methods.

The phrase 'as if' in the first sentence is significant. Science does not rule out metaphysical explanations; however, experimentation is restricted to the physical. Individuals holding to emergence and systems theory conduct investigations in a scientific manner and differ from reductionist science only in their methodologies.

However, as concepts become more speculative, the ability to test propositions becomes problematic. Kauffman's fourth law of thermodynamics provides a pathway for abiogenesis without the improbability. However, concluding that the existence of life verifies his law is comparable to saying a 747 jumbo jet is evidence of a tornado's work in a junkyard. Kauffman's law can be used to predict outcomes; however, apart from relatively simple systems, verification with physical observation becomes problematic. These issues are not unique to a metaphysical position, but manifest themselves in predictions of string theory and the existence of a multiverse. These problems are often swept away by broadening the scope of what science does. When referring to the Quantum Multiverse, Greene (2011, p. 271) states

> The ability to predict behavior is a big part of physics' power; but the heart of physics would be lost if it didn't give us a deep understanding of the hidden reality underlying what we observe.

Summary

In summary this response to WITE posits the basis of reality at least in part on an eternal metaphysical essence. A broad range of worldview positions are encompassed with this answer, but at the core there must be something beyond the material universe that explains its existence and its order. Regardless of one's feelings about this response to WITE, it is no more or less scientific than an eternal, material universe or a universe from nothing. Each of these positions proposes scientific questions that can be verified or proven false. However, negative results do not change the axiomatic assumptions, but change one's view of how the eternal affects the knowable universe. Hawking (2010, p. 33) feels "the illusion of free will works well from an operational perspective" and Chopra believes free will gives us control over what happens in the physical world (Chopra & Mlodinow, 2011). Neither position will be established by scientific merit, but will be decided upon by individuals as they evaluate their experience of reality.

THE PERSONAL CREATOR

The final response to WITE is a personal creator. This response holds that the eternal Creator brought about the known universe by choice. The universe is dependent on the Creator's actions and did not co-exist or impose fundamental restrictions on what could and would exist. Although certain design choices put limitations on contingent aspects of the universe, the Creator is free to design the medium as well as the content, just as an artist choses his canvas, paints and subject. The Creator is personal in that He chooses to communicate with His creation. If that were not so, this response to WITE would be indistinguishable from the fourth response, a metaphysical essence.

Historically, development of Western science was rooted in a belief that an eternal, unchanging Creator designed and sustains our Universe. (Pearcey & Thaxton, 1994) Although the Creator is transcendent and fundamentally unknowable, His attributes are manifest in the lawfulness and vastness of nature and the rationality and morality of man. (Psalms 19; Isaiah 40; Romans 1, 2) Regardless a person's position on WITE, the existence of a Creator allows each person to discover the universe because its reality is anchored in the nature of the Creator. Science does not prove the existence of the Creator, but rather confirms the manner in which the Creator interacts with His creation. Scientific Creationism, Intelligent Design and traditional science all develop models to predict and explain physical phenomena under the assumption that knowledge about our Universe is attainable and valuable. Fine-tuning is an expected outcome of a created universe. Whether weak or strong anthropic principles are in effect, intelligent life is a part of and intended feature of the creation. The presence of higher dimensions or multiple universes is compatible with a created universe, but is unnecessary to explain the existence of our Universe. The purpose of science is to discover the mysteries of the creation and thereby benefit from it. Belief in a Creator does not hinder or limit science, but provides a useful foundation from which to pursue it. (Moreland, 1989)

Significance of Choice

If our Universe is a volitional act of a Creator, it will not be of the same essence as the Creator. The Creator is not expected to be a physical entity bound by space/time or even the cosmic substratum; otherwise the eternal would be a materialistic process and the Creator would be no different than the Greek gods of Mount Olympus. If the eternal is merely a metaphysical essence, a personal Creator, although powerful, would only be an emanation or lesser representation of all reality and would potentially be one among many as in Hinduism. In either case it would potentially be possible to discover limitations of the Creator and, therefore, define His properties, processes and purposes. This issue has made the connection between human design and the design of a Creator problematic. (Ratzsch, 2005) However, with the assumption that human design is a subset of the Creator's design, many advances have been made in engineering through biomimicry.

If the Creator is volitional, then it is fundamentally impossible to discern His purposes apart from direct communication. When discussing the use of spies in *The Art of War*, Mei Yao-ch'en notes

> knowledge of the spirit-world is to be obtained by divinations; information in natural science may be sought by inductive reasoning; the laws of the universe can be verified by

> mathematical calculation: but the disposition of an enemy are ascertainable through spies and spies alone. (Sun Tzu, 1971, Chapter 13)

If the disposition of the Creator is to be ascertained, it will not be through physical law, reason or divination, but by the testimony of one in contact with the creator. This assumes the Creator wants to be known and initiates the communication. (Schaeffer, 1972a) In addition the purpose of communication goes beyond merely being known to having a relationship. (Lewis, 1991)

Communication from the Creator

The greatest challenge within this response to WITE is to determine how the Creator communicates with His creation. As already expressed, the physical creation communicates some aspects of the Creator's attributes. However, if He no longer interacts with the creation, this deistic Creator is indistinguishable from a materialistic eternal. Within the scope of traditional theism, many views abound with regard to the interface between faith and science (Carlson, 2000); however, this misses the point. Science cannot determine the answer to WITE. Although evidences abound to support the God Hypothesis (Meyer, 1999), those same evidences are used to support the metaphysical essence of a self-aware universe. (Goswami, 1995) The distinguishing factor of this response to WITE is special revelation.

Many claim to receive special revelation through dreams and experiences; however, two criteria are established in the Bible to validate communication from the Creator. The first is consistency between the message and what was revealed in the past. This implies there is a consistency between His natural revelation and His special revelation. Secondly is foretelling. Just as a spy must communicate information that can be obtained by no other means, so a prophet accurately foretells unexpected events of the future. This approach is used to validate Isaiah's message when he says,

> …I declare them to you from of old, before they came to pass I announced them to you, lest you should say 'My idol did them'…From this time forth I announced to you new things, hidden things that you have not known… They are created now…, lest you should say, Behold I knew them. (Isaiah 48:3-13, ESV)

If the creation of our Universe is distinct from the other responses to WITE, it is only known through direct revelation from the Creator. In light of this, the preeminence of the Creator is established with His first words. The significance of this is well articulated by Schaeffer (1972b) when he says,

> Some Christians became excited about the big bang theory, thinking that it favored Christianity. But they really missed the point – either the point of Scripture or the big bang theory or both. The simple fact is that what is given in Genesis 1:1 has no relationship to the big bang theory – because from the scriptural viewpoint, the primal creation goes back beyond the basic material or energy. Even if one accepts the big bang theory, Genesis 1:1 would then go beyond it by saying that God created out of nothing the primal stuff present at the big bang. We have a new thing created by God out of nothing by fiat, and this is the distinction.

Summary

In summary this response to WITE holds to a Creator that self-exists and all of reality is derived from and sustained by Him. In addition what distinguishes this response to WITE from others is that this Creator communicates with His creation for the purpose of relationship. An eternal, personal Creator provides a foundation for scientific investigation; however, these pursuits cannot answer the question of WITE. It is an axiomatic assumption and must be accepted by faith. Although all of the scenarios describing the origin of our Universe can be subsumed under theism, if the primary distinguishing factor of this response is divine revelation, then what is revealed about our origin should take precedence over what is discovered by scientific means.

CONCLUSION

Five responses to the question WITE have been presented. Although statements from the same science author may fall under multiple responses, it is due to his eclectic approach to philosophy. Since responses to WITE encompass aspects of the cosmological and teleological arguments for the existence of God, confusion may occur as the response moves from the origin of our Universe to that of life and mind. Regardless, the main point is "the response to WITE is not a scientific one." It is a statement of faith in an axiomatic assumption. Once a response is chosen, there is an impact on how one frames scientific investigation, what is reality and how one finds purpose in life.

WITE frames scientific investigation

Although a vast majority of scientific pursuits can be harmoniously pursued from varying responses to WITE, each person comes with fundamental assumptions. These become apparent when data is extrapolated well beyond direct measurement in both space and time. In the area of biology the evolutionary paradigm is applied to a range of problems from variation in bacteria populations to the descent of all organisms from a primordial parent. All responses to WITE agree on the ability of natural selection to generate variation within bacteria, but many would disagree that novel features between kingdoms and phyla are achieved by the same means. Richard Dawkins (1996) describes the transition from a photosensitive spot to a camera-type eye through incremental functional steps. However, this assumes that each of the incremental steps is useful and there is a smooth transition between variations in the genome and the expression in the phenotype. Likewise there is an inherent assumption that the genome has a significant amount of "junk DNA" to act like scratch paper from which useful variation can arise. Others feel variation arises more quickly through a process nicknamed Evo Devo. (Carroll, 2005) Creationist feel the information in an organism's genome was created in the beginning and, therefore, variation occurs within baramin. (Wood *et al*., 2003) The role of "junk DNA" appears to be essential for the first explanation, while none is required for the creationist model. Although the press release from the ENCODE project declares that at least 80% of the human genome is active (Kolata, 2012), the three explanations for variation will remain unchanged. Only the role of "junk DNA" will be redefined.

WITE and reality

One's response to WITE not only affects how he approaches science, but also how he feels reality operates. From a pragmatic sense the materialist answer seems the most fitting because most of life involves responses to immediate stimuli and situations. If our Universe is not eternal, then order must arise from simplicity. Dawkins (2008) describes this process as a crane on the side of a structure, building it to greater heights. He criticizes the theistic position by likening it to an improbable and unnecessary skyhook. Via Occham's Razor (the simplest solution is the best) Dawkins concludes that the materialistic solution is the scientific one. However, he overlooks the improbability of his own solution. Kauffman (1995, p. 25) speaks of "Order, vast and generative, arises naturally." But if this were true, would we not still believe in spontaneous generation? Krauss (2012, p. 126) justifies a universe from nothing by stating "something that is not impossible is virtually guaranteed to occur somewhere within it." But does that match reality? He goes on to describe in almost religious terms,

> The tapestry that science weaves in describing the evolution of our universe is far richer and far more fascinating than any revelatory images or imaginative stories that humans have concocted. Nature comes up with surprises that far exceed those that the human imagination can generate. (Krauss, 2012, p. vxi)

Greene's concluding remarks with respect to his survey of parallel universes, asks the question

> Do we allow science to follow any and all paths it reveals, to travel in directions that radiate from experimentally confirmed concepts but that may lead our theorizing into hidden realms that lie, perhaps permanently, beyond human reach? (Greene, 2011, p. 361)

If the answer is yes, then care must be taken to emphasize the speculative nature of the work. Unfortunately, too often the cautious path has been ignored by using the authority of well confirmed science to foist worldview assertions in the name of physics, biology and cognitive science. Ultimately it comes down to *caveat emptor*, let the buyer beware. It is up to us to decide whether a particular response to WITE coheres with reality.

WITE and purpose

Finally, one's response to WITE affects how he derives meaning in life. All of the responses described above involve an eternal entity that is impersonal, except the last one. Speaking from a materialist perspective, William Provine states, "No ultimate foundations for ethics exist, no ultimate meaning in life exists, and free will is merely a human myth." (Provine & Johnson, 1994) In an impersonal Universe, meaning must be derived individually or collectively as a society. Since evolutionary theory is essential in all of these responses, Dowd (2007) feels everyone should take a "meta-religious perspective" and live a life committed to "deep, or evolutionary, integrity." (Dowd, 2007, p. 52) He goes on to explain how all religious practices are connected to the artifacts of human evolution. Therefore, we should adopt a pluralistic acceptance of each other, based on our common evolutionary heritage.

However, the last response to WITE involves a personal Creator. It is no longer "What is the eternal," but "Who is the eternal?" If revelation is provided outside of our Universe, our purpose and values are no longer self-generated, but derived from the Creator. This leads to the ultimate choice, "Am I responsible to a standard outside myself, or is meaning self-generated?" If meaning is imposed outside of our Universe by a Creator, then it does not matter how I chose. I am still accountable to the Creator and must respond to His revelation or bear the consequences.

Science has opened a window of understanding that is surprising and vast. However, there is a temptation to overestimate our knowledge by making such abiogenesis assertions as "… anything that is not proscribed by the laws of physics must actually happen – it seems most reasonable to consider these possibilities." (Krauss, 2012, p. 163) Rather, we should demonstrate the humility reflected by Newton's comment that "I seem to have been only like a boy playing on the sea-shore, and diverting myself in now and then finding a smoother pebble or prettier shell than ordinary, whilst the great ocean of truth lay all undiscovered before me." (Brewster, 1855, p. 407) Science is a window on the world and its perspective is limited. As a result it must be used within a broader philosophical context. A noted cosmologist describes it as follows:

> … I do not believe that scientific progress is always best advanced by keeping an altogether open mind. It is often necessary to forget one's doubts and to follow the consequences of one's assumptions wherever they may lead -- the great thing is not to be free of theoretical prejudices, but to have the right theoretical prejudices. And always, the test of any theoretical preconception is in wherever it leads. (Weinberg, 1993, p. 119)

Your response to WITE will frame your basic assumptions and should be chosen based on all of reality, not just science. In turn, when followed to their conclusion, where does your response to WITE lead?

ACKNOWLEDGMENTS

I would like to thank Cedarville University and my colleagues in the Department of Science and Mathematics for thoughtful discussion through the years. I would like to thank the students, who took my honor's course: Chance, Emergence or Design. This work is an outgrowth of discussions originating in class. I appreciate my church for providing an opportunity to practice these ideas on them. Finally and most importantly, I want to thank my wife and children who patiently shared me with the computer during the writing of this paper.

REFERENCES

Aristotle (2007), *Physics*, NuVision Publications, Sioux Falls, SD.

Augustine (1958), *The city of God*; an abridged version from the translation by Gerald G. Walsh. Image Books, Garden City, NY.

Barbour, J. (1999), *The end of time: the next revolution in physics*. Oxford University Press, Oxford.

Brewster, D. (1855), *Memoirs of the life, writings and discoveries of Sir Isaac Newton, Vol. II.* T. Constable and Co., Edinburgh.

Carlson, R. Ed. (2000), *Science & Christianity: four views*. InterVarsity Press, Downers Grove, IL.

Carroll, S. (2005), *Endless forms most beautiful: the new science of evo devo and the making of the animal kingdom*. Norton, New York.

Carter, B. (1974), Large number coincidences and the anthropic principle in cosmology, *IAU Symposium 63: Confrontation of Cosmological Theories with Observable Data*, Dordrecht, NL.

Chopra, D. and Mlodinow, L. (2011), *War of the Worldviews*. Harmony Books, New York.

Darling, D.J. (1989), *Deep time*, Delacorte Press, New York.

Dawkins, R. (1996), *Climbing Mount Improbable*. W.W. Norton, New York.

Dawkins, R. (2008), *The god delusion*. Houghton Mifflin Co., Boston.

Dembski, W. (1998), *The design inference: eliminating chance through small probabilities*. Cambridge University Press, Cambridge.

Dembski, W. (2002), *No free lunch: why specified complexity cannot be purchased without intelligence*. Rowman & Littelfield Publishers, Inc, Oxford.

Franchi, S., Guzeldere, G. & Minch, E. (1997), Interview with Heinz von Foerster, *Stanford Humanities Review: Constructs of the Mind: Artificial Intelligence and the Humanities*. http://www.stanford.edu/group/SHR/4-2/text/toc.html Web. 21 Sept. 2012.

Gardner, J. (2003), *Biocosm the new scientific theory of evolution: intelligent life is the architect of the universe*. Inner Ocean Publishing, Inc., Maui, HI.

Goswami, A. (1995), *The self-aware universe*. Tarcher/Putnam, New York.

Greene, B. (1999), *The elegant universe: superstrings, hidden dimensions, and the quest for the ultimate theory*. W.W. Norton & Company, New York.

Greene, B. (2011), *The hidden reality: parallel universes and the deep laws of the cosmos*. Vintage Books, New York.

Gribbon, J. (2010), *In search of the multiverse: parallel worlds, hidden dimensions, and the ultimate quest for the frontiers of reality*. Wiley, Hoboken, NJ.

Guth, A. (1997), *The inflationary universe: the quest for a new theory of cosmic origins*. Addison-Wesley Publishing, Reading, MA.

Hawking, S.W. (1988), *A brief history of time: from the big bang to black holes*. Bantam Books, New York.

Hawking, S.W. and Mlodinow, L. (2010), *The Grand Design*. Bantam Books, New York.

Hoyle, F. (1983), *The intelligent universe*. Holt, Rinehart, & Winston, New York.

Hoyle, F., Burbidge, G. and Narlikar, J. (2000), *A different approach to cosmology: from a static universe through the big bang towards reality*. Cambridge University Press, New York.

Kauffman, S. (2000), *Investigations*. Oxford University Press, Oxford.

Kitzmiller v. Dover Area School District. 04cv2688. United States Federal Court. 2005. http://www.pamd.uscourts.gov/. Web. 10 Sept. 2012.

Kolata, G. (2012), Bits of mystery dna, far from 'junk,' play crucial role, *New York Times on the Web*. Retrieved September 5, 2012, from http://www.nytimes.com/.

Krauss, L.M. (2012), *A universe from nothing*. Free Press, New York

Kuhn, T. (1962), *The structure of scientific revolutions*, University of Chicago Press, Chicago.

Kurzweil, R. (2006), *The singularity is near: when humans transcend biology*. Penguin Books, New York.

Lanza, R. and Berman, B. (2009), *Biocentrism: how life and consciousness are the keys to understanding the true nature of the universe*. BenBella Books, Inc., Dallas, TX.

Lewis, C. (1991), *The four loves*. Harcourt, Brace, Javanovich, New York.

Lisle, J. (2009), *The ultimate proof of creation: resolving the origins debate*. New Leaf Publishing Group/Master Books, Green Forest, AR.

Meyer, S. (1999), The return of the God hypothesis. Retrieved October 19, 2012, from http://www.arn.org/docs/meyer/sm_returnofgod.pdf.

Moreland, J.P. (1989), *Christianity and the nature of science: a philosophical investigation*. Baker Book House, Grand Rapids, MI.

Morowitz, H. (2002), *The emergence of everything: how the world became complex*. Oxford University Press, Oxford.

Muller, M. ed. (1969), *The sacred books of the east*. Motial Banarsidass, Delhi.

Paley, W. (1802), *Natural Theology: or, evidence of the existence and attributes of the deity, collected from the appearances of nature*. Oxford University Press, Oxford.

Pearcey, N. and Thaxton, C. (1994), *The soul of science: Christian faith and natural philosophy*. Crossway Books, Wheaton, IL.

Plato (1965), *Timaeus*, edited and translated by J. Warrington. Dutton, New York.

Popper, K. (1963), Conjectures and refutations, *Readings in the Philosophy of Science*, T. Schick, Editor, Mayfield Publishing Company, Mountain View, CA.

Provine, W. and Johnson, P. (1994), Darwinism: science or naturalistic philosophy?, Stanford University Debate April 30, 1994. Retrieved October 17, 2012, from http://www.arn.org/docs/orpages/or161/161main.htm.

Ratzsch, D. (2009), Teleological arguments for God's existence, *The Stanford Encyclopedia of Philosophy*, E.N. Zalta Editor, Stanford University, Stanford, CA.

Rees, M. (1998), *Before the beginning: our universe and others*, Perseus Books, Reading, MA.

Schaeffer, F. (1972a), *He is there and he is not silent*. Tyndale House Publishers, Inc., Wheaton, IL.

Schaeffer, F. (1972b), *Genesis in space and time: the flow of biblical history*. InterVarsity Press, Downers Grove, IL.

Simpson, G. (1949), *The meaning of evolution: a study in the history of life and of its significance for man*. Yale University Press, New Haven, CT.

Smolin, L. (1997), *The life of the cosmos*. Weidenfeld & Nicolson, London.

Smolin, L. (2001), *Three roads to quantum gravity*. Basic Books, New York.

Sturluson, S. (1954), *The prose Edda: Tales from Norse mythology*, Trans. J. I. Young. University of California Press, Berkeley, CA.

Sun-Tzu (1971), *The art of war*, Translated by S.B. Griffith. Oxford University Press, Oxford.

Susskind, L. (2005), *Cosmic landscape: string theory and the illusion of intelligent design*. Little, Brown & Co., New York.

The Holy Bible (2001), English Standard Version. Crossway Bibles, Wheaton, IL.

Von Bertalanffy, L. (1969), *General systems theory: foundations, development, applications*. George Braziller Inc., New York.

Wald, G. (1954), The origin of life, Scientific American, (August 1954), pp. 44-53.

Weinberg, S. (1993), The first three minutes: a modern view of the origin of the universe. Basic Books, New York.

Wheeler, J. (1998), *Geons, black holes, and quantum foam: a life in physics*. Norton, New York.

Wheeler, J. (1990), *A journey into gravity and spacetime*. W.F. Freeman & Co., New York.

Wood, T., Wise, K., Sanders, R., and Doran, N. (2003), A refined baramin concept, *Occasional Papers of the Baraminology Study Group*. 3:1-14.