

Faith, Mathematics, and Science: The Priority of Scripture in the Pursuit and Acquisition of Truth

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Abstract

In this paper, we present several arguments to support a literal, or natural, interpretation of Scripture. Even though Mathematics and Science have made vast contributions to the body of knowledge, we conclude that *scientific information does not have adequate authority to require rejection of a literal interpretation of Scripture*.

We proceed from a decidedly Christian perspective including the convictions that God created an orderly universe (and that studying nature provides valuable information about Him), and that God inspired His Word (and that the Bible, even *more clearly*, expresses information about Him).

We discuss some of the essential tools used by mathematicians and scientists for the discovery of truth - namely, models. We examine some valuable models from history, and briefly discuss that as additional scientific information became available, the models required refinement, and sometimes replacement. The Bible, on the other hand, is perfect and needs no corrections.

We also briefly consider the following items:

1. The nature of higher dimensions and how a literal reading of the Bible can be supported by understanding some of the implications of higher dimensions;
2. The role of hermeneutics in Biblical interpretation (and scientific interpretation) regarding reconciliation of science with the Bible;
3. Finally, we speculate about possible implications for the frequent use of the phrase “[God] stretched out the heavens.”

We conclude by summarizing the results and recognizing that as we study mathematics and science, along with God’s Word, we can know the truth. In fact, God’s plan for each of us is to know Him Who is the Truth.

1 Introduction

“Sanctify them by the truth; your word is truth.” (John 17:17)

1.1 Where are We Going?

In this paper we will examine some approaches for identifying truth as well as some issues involved in recognizing reliable sources of information. We will proceed from a decidedly Christian perspective including the convictions that God created an orderly universe, that studying nature provides

valuable information about Him, and that His Word, the Bible, even *more clearly*, expresses information about Him.

Our approach is intended to be consistent with that of Alister McGrath as described by Bradley and Howell:

Recently the theologian and scientist Alister McGrath has offered a new approach to natural theology. He suggests accepting special revelation as providing an interpretive framework through which nature can be seen (Bradley and Howell, 2011, p. 11).

With a slightly different emphasis, we would say that the special revelation of scripture can, and should, inform and modify the information we receive through general revelation (not the other way around).

We will begin by briefly discussing “truth” and “knowledge,” and then examine a specific cosmological model involving the existence of higher dimensions. We will observe that for some passages, adopting a literal interpretation of Scripture appears to be problematic, until we understand the nature of higher dimensions. As we will see throughout the paper, as more information becomes available, the reliability of Scripture is repeatedly confirmed.

We will continue by discussing some of the essential tools used by mathematicians and scientists for the discovery of truth - namely, models. We will examine some valuable models from history, and briefly discuss that as additional scientific information became available, the models required refinement, and sometimes replacement. We will conclude that when mathematical or scientific models lead to inconsistencies with other reliable sources of information (e.g. the Bible), we should be hesitant about rejecting the other sources (because models are subject to change).

Next, we will identify various implications for teaching and learning mathematics, as well as some implications for reconciling science with Scripture. All of these observations also have implications for worship as we understand a little more about God’s nature, the world of nature He created, and His desire to help us as we pursue and discover truth.

Sometimes, the reconciliation of scientific information with Scriptural information involves hermeneutics; so we will briefly examine the role of Biblical interpretation in Chapter 5 of the paper. Ultimately, one of the primary goals of this paper is to defend the literal interpretation of Scripture as the best interpretation (or at least the best place to begin the process of Biblical interpretation). While other sources of knowledge are very valuable, the Bible is the only perfect and flawless source of information we have.

We conclude by summarizing the results and recognizing that as we study mathematics and science, along with God’s Word, we can know the truth. In fact, God’s plan for each of us is to know Him Who is the Truth.

1.2 What is Truth?

The first chapter of John’s Gospel talks about the Word and truth:

In the beginning was the Word, and the Word was with God, and the Word was God.

... The Word became flesh and made his dwelling among us. We have seen his glory, the glory of the One and Only, who came from the Father, full of grace and truth (John 1:1, 14).

Then, near the end of the Gospel, Jesus and Pilate discussed kingdoms and truth, and Pilate uttered his famous question: “What is truth?” (John 18:38)

Part of the goal of education is the acquisition of knowledge and the discovery of truth. But before truth can be discovered, we need to understand how to identify it when we find it.

Geisler and Feinberg (2002) identify four theories of truth: the coherence theory, the pragmatic theory, the performative theory, and the correspondence theory. They conclude that only the fourth is consistent with Christian faith:

We have argued that the first three theories of truth are inadequate, that the correspondence theory alone is sufficient. As Christians, we cannot accept any theory of truth which results in either relativism or agnosticism. The Bible clearly declares that man can know the truth, and will be held responsible for such knowledge. [See, for example, John 8:32-36 and Romans 1:18-22.] (Geisler and Feinberg, 2002, p. 250)

And as they explain previously, “The correspondence theory of truth holds that truth consists in some form of correspondence between a belief or a sentence and a fact or a state of affairs” (Geisler and Feinberg, p. 247).

The correspondence theory of truth is the theory which is assumed in the study of science. When we study science and mathematics, we are trying to discover facts, and we are trying to formulate sentences which correspond to those facts.

If we approach the subject of truth from a Christian perspective, we can accept that God created an orderly universe and that there are certain true statements which can be made about the universe. In particular, we can agree with St. Augustine that “All truth is God’s truth”; so if we accurately interpret scripture and accurately interpret the scientific information, we should find beautiful harmony among the various sources of information about the universe.

1.3 How Do We Know?

If we “will be held responsible” for knowledge of the truth, how do we acquire that knowledge? This is one of the primary questions in the philosophical discipline of *Epistemology*. Willem Van De Merwe summarizes and explains several approaches to knowledge:

Knowledge can come from various sources, including the ones listed in the following:

1. Observations - passively acquired data. (Empiricism)
2. Experiments - actively acquired data. (Empiricism)
3. Reason - inductive or deductive mental processes leading to new knowledge. (Rationalism)

4. Scriptures - accepted written stories and proclamations containing knowledge and truth statements, which are not obtained empirically or rationally. (Religion)
5. Experiences - caused by events that happen and that affect our awareness or our “feelings.” (Existentialism)
6. Testimony of others. (Authoritarianism)
7. Traditions - transmitted generally accepted ways of doing or interpreting things within a cultural setting. (Authoritarianism)
8. Revelation - knowledge passively acquired either by everyone generally [*general revelation*], or specifically only by one individual or a select group of individuals [*special revelation*]. (Religion)
9. Faith - knowledge actively acquired through a spiritual process without recourse to reason. (Fideism)
10. Intuition/Imagination/Inspiration.

(Van De Merwe, 2014, p. 17-18)

In the following pages, we will discuss several of these approaches as well as some of their applications and limitations. *Two primary goals of the following discussion are to identify the Bible as the best and most perfect source of knowledge, and to recognize that adopting a literal interpretation of Scripture is both scholarly and defensible.*

1.4 Faith and Reason

In Isaiah 1:18, God invites us to dialogue - “Come now, let us reason together.” When God created man in His image, He gave us the ability to think. I find it very interesting that in John 1, Jesus is described as the Word - *Logos* - which carries the connotation of “*mind of God*.” I believe this reference to The Word reflects (at least partially) how Jesus embodies both divinity and humanity.

Hebrews 11 talks a lot about faith. Verse six says that “without faith it is impossible to please God.” A popular (secular) understanding of “faith” is the act of believing something, even if you know it is false. Actually, this type of thinking would better be described as “blind faith,” like the scientist who knows spontaneous generation is impossible, but because of naturalistic presuppositions, is forced to believe it. Another (more appropriate) understanding of “faith,” is the ability to accept certain truths when evidence is compelling, but not conclusive. If you cannot prove something conclusively (mathematically or logically), but there is supporting evidence, you can take a step of faith to accept the position. Another view of “faith” (from C.S. Lewis - *Mere Christianity* Book III Chapter 11) is the ability to hold onto something the mind once accepted, even when the position is inconvenient.

So what about mathematics? At the turn of the twentieth century, there was an effort to put all of mathematics and science on a firm logical foundation. Beginning with axioms, the goal was to prove (mathematically) everything that was known, and develop a system of logic by which everything could be proven. These efforts seemed to be yielding good progress, but there was always some unforeseen complication; a complete mathematical structure proved to be elusive. In 1931, the Austrian mathematician Kurt Gödel dashed the hopes for a complete mathematical system when he published his celebrated “Incompleteness Theorem.” In short, he proved that there is no

(adequately powerful) complete system of mathematical logic; if such a system could be developed, it would prove not only all true things to be true, it would also prove all false things to be true. To remain consistent, a system of mathematical logic must be incomplete. In other words, there will always be some true things which cannot be proven.

A common secularist mantra is to accept nothing based on faith alone; accept only those propositions which can be proven. In light of Gödel's Incompleteness Theorem, such thinking will be inadequate for certain truths; in short, "faith" is necessary for the discovery of certain truths. My hope and prayer is that people will be able to recognize the role of faith in the acquisition of truth, and in the receiving of The Truth (John 14:6).

2 The Origin of the Universe - Genesis 1:1

"By faith we understand that the universe was formed at God's command, so that what is seen was not made out of what was visible." (Hebrews 11:3)

2.1 The Beginning

When did God create the heavens and the earth? "In the beginning!" (Genesis 1:1). This truly was the beginning of our universe - our three-dimensional space-time continuum. Augustine also understood that time had a beginning, as noted by Bradley and Howell:

Augustine spent many years reflecting on the book of Genesis. He concluded that the opening words of the Bible, "In the beginning ..." refer to the beginning of time (Bradley and Howell, 2011, p. 224).

With the beginning of the universe, there was also the beginning of Science. When God created the universe, He implemented many scientific and mathematical laws, which demonstrates in nature something that we already know from scripture - God is a God of order (see, for example, I Corinthians 14:33; also, Psalm 104 is a celebration of God's creativity and order in nature).

But what about the beginning of Mathematics; or did Mathematics have a beginning? If we consider the nature of God (the Trinity), we see that the concepts of "oneness" and "manyness" (and the concept of "number") seem to exist before the creation of the universe (see Poythress, Chapter 2). An important philosophical question, which is still debated by mathematicians, is whether mathematics is *invented* or *discovered* (see Bradley and Howell, Chapter 10). As image-bearers of God, we certainly have creative abilities; but since God is omniscient, we must conclude that He knows everything, and thus, that He knows all of mathematics. But we have the opportunity to experience joy and excitement as we discover the mathematical laws He created.

2.2 A New Dimension

As mentioned above, when God created the heavens and the earth, our three-dimensional space-time continuum came into being. Before Genesis 1:1, the three-dimensional universe did not exist.

There are several biblical passages which indicate that there is a realm beyond our three-dimensional universe - a realm with more dimensions; perhaps this can be understood as the spiritual realm. Many of the verses are included at the end of this chapter; one example is:

... so that Christ may dwell in your hearts through faith. And I pray that you, being rooted and established in love, may have power, together with all the saints, to grasp how wide and long and high and deep is the love of Christ (Ephesians 3:17-18).

When Paul was describing the love of Christ, he could have easily accomplished his objective by using three dimensions - say length, width and height - but he chose to use four dimensions. This is certainly not a proof that Paul was referring to higher dimensions, and some scholars readily point out that ancient Jewish writers often used *hyperbole* - intentional exaggeration for emphasis; but this passage could also hint at the possibility that we should try to understand the nature of higher dimensions. As a mathematician, I can readily accept the theoretical existence of higher dimensions (even if it is difficult to try to visualize higher dimensions). When I was first introduced to the concept of higher dimensions by my former mathematics professor, Dr. Donald H. Porter, he suggested examining how our three-dimensional world might relate to a two-dimensional world.

2.3 Two-Dimensional Nature

A two-dimensional world is a flat surface. (Strictly speaking, a two-dimensional world need not be “flat,” but is approximately flat locally.) The book *Flatland*, [2], by Edwin A. Abbott gives a rather detailed description of the nature of a two-dimensional world. There is no concept of “up” in this world; there is only length and width - no height. Inhabitants, as well as all objects, are plane figures such as circles, squares and triangles. A room in a house in this world might be in the shape of a square, with a swinging line segment for a door. Now suppose that in a certain room there is a two-dimensional “person.” Since we are in a three-dimensional realm, he has no perception of us; we do not exist in his world because to him, there is no concept of “up” (and he would need to look up to see us). We might place our hand very close to his body, and even though we might be closer to him than anything in his two-dimensional world, he has no realization of our presence.

Now if we reach down and touch the inside of his room, he would perceive a blot. He would probably be startled, for from his point of view, the blot appeared from nowhere. If we now remove our finger, the blot would immediately disappear; or if we move our finger across the boundary of his room, the blot would seem to have moved through a wall. Also, if there were something wrong inside his body, we could see the problem, reach inside, and fix the problem. From his perspective, this might look like a miracle, but from our point of view, everything is quite natural.

Finally, if there were two people in the two-dimensional world, one in the room and one outside the room, we could see both of them from our position in three-dimensions, but they would not be able to see each other; and if they were somehow allowed to perceive three-dimensions, they would both be able see us, even though they would still be unable to see each other. And if we could communicate with them, we could inform them that we are able to “see all around them” even though their line of vision is in only one direction. If they were to try to describe this ability of ours, they might say that we are covered with eyes all around. This idea may cause us to recall the images in the Biblical books of Ezekiel (chapter 10) and Revelation (chapter 4) about some of the creatures covered with eyes.

2.4 Applications to Spiritual Phenomena

Considering the relationship between two-dimensions and three-dimensions, we can anticipate the possibilities of certain unusual experiences if, in fact, the spiritual realm can be characterized as four-dimensional (or more than four). For example, Jesus appeared to walk through walls after his resurrection (John 20). He appeared (and disappeared) miraculously after talking with the disciples on the Emmaus road (Luke 24). Moses and Elijah appeared (and disappeared) on the Mount of Transfiguration (Matthew 17). There are many examples of similar phenomena in both the Old and New Testaments. And there are other implications.

An interesting result from Einstein's General Theory of Relativity and higher dimensions is the theoretical possibility of things called "wormholes," discussed by Hawking and Mlodinow (Hawking and Mlodinow, 2005, Chapter 10). Briefly, wormholes allow for shortcuts through space which can be available because of the curvature of space. On pages 110 and 139 of their book, they provide pictures of what a wormhole may look like. The interesting thing is that these pictures resemble something like a funnel or a vortex. This may cause us to remember (II Kings 2:11) that when Elijah was taken away, he "went up to heaven in a whirlwind." This does not prove anything, but the similarity is interesting.

In the above-mentioned verses from Ephesians, we included both verses seventeen and eighteen. We discussed verse eighteen in some detail - the reference to four dimensions. Verse seventeen talks about Christ dwelling in our heart by faith. As children, we are willing to talk about Jesus living in our heart; but when we get older (and more mature), we come to realize that this kind of talk is only symbolic - we don't really think there is a little person inside our physical "blood-pumping organ." But if we accept the possibility that the spiritual realm is a higher dimensional realm, then it is possible that Jesus literally lives inside every true born-again believer. I am convinced that Jesus literally lives in my heart. Some might consider this idea simple-minded or immature, but the math and the Scripture agree that a literal interpretation might be acceptable for Ephesians 3:17. As we said in Section 1.1, understanding the nature of higher dimensions can sometimes support a literal reading of the Bible.

2.5 Summary

As I continue to study the Bible, and as I continue to study Mathematics and Science, I continue to be overwhelmed by the beauty of creation and by the majesty of our Creator, Savior, and Lord. The following passages from the Bible may suggest the existence of higher dimensions, some directly, some indirectly, and studying these passages can possibly give a new perspective on some old stories from the Bible. Again we see that even when Scripture seems to violate known scientific laws, a figurative or symbolic interpretation is not necessary; indeed, a literal interpretation may be the best interpretation.

1. Genesis 5:21-24 – Enoch miraculously taken away to another dimension (?)
2. II Kings 2:11 – Elijah taken away in a whirlwind to another dimension (?)
3. II Kings 6:15-17 – Elisha's servant's eyes opened to see higher dimensions (?)
4. Ezekiel 10:12 – Creatures completely covered with eyes

5. Daniel 10:1-21 – Daniel (but not his companions) saw into higher dimensions (?)
6. Matthew 17:1-5 – Moses and Elijah arrive from and depart to higher dimensions (?)
7. Luke 24:13-31 – Jesus vanishes to another dimension (?)
8. John 6:21 – The boat *immediately* reached the shore
9. John 20:19, 26 – Jesus walks through walls from another dimension (?)
10. Acts 1:9 – Jesus taken away to another dimension (?)
11. Acts 8:39-40 – Philip transported (through a wormhole?)
12. Acts 9:3-7 – Saul (but not his companions) see into another dimension (?)
13. Acts 12:5-11 – Peter’s deliverance through another dimension (?)
14. II Corinthians 12:2-4 – Paul’s vision of the third heaven (another dimension?)
15. Ephesians 3:17-18 – Explicit reference to four dimensions
16. Ephesians 6:12 – Spiritual warfare (in another dimension?)
17. Hebrews 11:5-6 – Reference (again) to Enoch
18. Revelation 1:7 – Every eye will see him (through another dimension?)
19. Revelation 4:6-8 – Creatures covered with eyes

3 Models - Uses and Limitations

“The kingdom of heaven is like ...” (Matthew 13:24, 31, 33, 44, 45, 47)

3.1 Introduction

In studying the physical world, scientific and mathematical models are developed to represent various phenomena. As a familiar example, many people may have memories of assembling a model car or model airplane. A model is not identical to the “real thing,” but a good model can fairly represent the genuine article; and, with more details, the representation can be made more accurate. But we must never confuse the model with the phenomenon being represented (we will call this the *confusion fallacy*). The model is just a model, not the thing itself.

A useful mathematical model from calculus and physics is based on the formula

$$s(t) = \frac{1}{2}gt^2 + v_0t + s_0.$$

Using this model, we can determine how long it will take for a rock to hit the ground if it is dropped from a height of, say, 64 feet. This model works very well in most typical situations. But if we drop the rock from a height of 64,000 feet, the model will not give a precisely correct answer. As

the velocity increases (while the rock is falling) the wind resistance becomes a significant factor. And so the model above (which ignores wind resistance) is no longer as useful. Models can be very valuable tools for a scientist or mathematician, but when extreme situations are being analyzed, models must sometimes be enhanced, or even completely discarded and replaced.

In this chapter, we will briefly discuss three historical models which seemed to provide very good explanations for the phenomena they represented, but when additional evidence became available, they were found to be deficient and required refinement, or even replacement. We can learn from the words of the 20th Century statistician G. E. P. Box: “All models are wrong; some are useful” (Cannon, et al., 2019, p. 2).

We will look at Ptolemy’s model of the universe, Newton’s laws of motion, and Darwin’s theory of evolution by Natural Selection.

3.2 Ptolemy’s Model of a Geocentric Universe

From antiquity, people have noticed that each new day, the sun rises in the East, is nearly straight up at noon, and sets in the West. Ptolemy’s model was accepted as the correct representation of the universe from the second century until the middle of the sixteenth century. Based on observations and confirmed by detailed calculations, the model proved to be very useful for describing planetary motion and predicting future motion. As Alister McGrath summarizes, the model is based on the following assumptions:

1. The earth is at the center of the universe;
2. All heavenly bodies rotate in circular paths around the earth;
3. These rotations take the form of motion in a circle, the center of which in turn moves in another circle. This central idea, which was originally due to Hipparchus, is based on the idea of epicycles - that is, circular motion imposed upon circular motion (McGrath, 2010, p. 18).

As mentioned above, this model was very useful, and in most cases gave reliable results. But as more information became available based on additional (extreme) observations, the model was no longer feasible. Because of the *confusion fallacy*, there was significant difficulty in refining the model. Some scholars point to this issue as a classic example of the conflict between faith and science. And while many people acknowledge the culpability of the church in this matter, McGrath (p. 22) explains that the conflict was more between competing political/ecclesiastical forces (and some philosophical differences about Biblical interpretation) than between faith and science. The existing intellectual establishment, with its power structure, resisted change. But with continued accumulation of observed data, the geocentric model, which persisted for more than 1000 years, was eventually discarded and replaced by a heliocentric model for our solar system.

3.3 Newton’s Models of Motion

Many people point to the work of Sir Isaac Newton as the beginning of the Scientific Revolution. Newton’s famous laws led to an explosion of scientific knowledge in the seventeenth and eighteenth

centuries. His laws were based on some very natural (and quite obvious?) assumptions about the nature of the universe. Percy and Thaxton summarize as follows:

Absolute space remains, according to its nature and without relation to an external object, always constant and fixed.

Absolute, true, mathematical time passes continually, and by virtue of its nature flows uniformly and without regard to any external object whatsoever (Percy and Thaxton, 1994, p. 167).

Newton's laws were so powerful that some have suggested that they led to the Industrial Revolution. They were very accurate whenever and wherever they were tested. His model was based on observation, confirmed by further observations and detailed calculations, and accurate for predicting future phenomena.

Newton's model persisted for more than 300 years, and again, the *confusion fallacy* emerged. The accuracy was so striking that a mechanistic model of the universe soon became the prevailing cosmological model, and this led to the rise of Deism as a theology and rationalism as a philosophy. Deism and rationalism had already been around for a while, but the predictive power of Newton's laws gave them intellectual support. As McGrath observes: "... Deism owed its growing intellectual acceptance in part to the success of the Newtonian mechanical view of the world" (McGrath, p. 31).

However, as extreme data (light years away) became available, some inadequacies became apparent in Newton's models. The (long-standing, self-evident, intuitively obvious) assumption about the Euclidean nature of the universe came into question. As Poythress notes:

Albert Einstein's general theory of relativity postulated that space (together with time, which is treated as a fourth dimension not strictly isolatable from the spatial dimensions) is curved, not Euclidean (Poythress, 2015, p. 138).

Einstein's theory, also based on observations and confirmed by calculations and predictions, postulated that the presence of gravitational fields actually curved space. The underlying assumptions supporting Newton's model (which was so successful throughout the Industrial Revolution) were substantially refined and replaced by Einstein's theories of relativity.

3.4 Darwin's Model of Evolution by Means of Natural Selection

With the success of Newton's model and the subsequent rise of rationalism as a dominant philosophy, *naturalism* gradually became the framework for scientific investigation. At the beginning of the scientific revolution, most scientists were Christians; but as Anderson observes:

By the nineteenth century, secular trends began to change the perspective of scientists. This culminated with the publication of *On the Origin of Species* by Charles Darwin. His theory of evolution provided the foundation needed by naturalism to explain the world without God (Anderson, 2008, p. 15-16).

A simplified summary of Darwin's model begins by observing that many forms of life (e.g. plants, animals, people) have the ability to adapt to changing environmental conditions. (This is commonly called *microevolution*.) With enough time and enough environmental changes, the adaptations can be very dramatic. In fact, if individual members of the same species became separated and evolved separately under different environmental conditions, there could emerge two brand new species - different from each other and different from the original species from which they descended. Thus we have the claim that humans and chimpanzees have a common ancestor. (This is commonly called *macroevolution*.)

Behe provides a more detailed description:

Like many great ideas, Darwin's is elegantly simple. He observed that there is variation in all species: some members are bigger, some smaller, some faster, some lighter in color, and so forth. He reasoned that since limited food supplies could not support all organisms that are born, the ones whose chance variations gave them an advantage in the struggle for life would tend to survive and reproduce, outcompeting the less favored ones. [This phenomenon is known as "survival of the fittest."] If the variation were inherited, then the characteristics of the species would change over time; over great periods, great changes might occur (Behe, 1996, p. 3-4).

Darwin's model was based on observations, and confirmed by additional observations and calculations. Even though it was not universally accepted, the scientific establishment, which consisted primarily of naturalists, eventually embraced the theory, even to the point of considering it an established scientific fact.

Its acceptance in the scientific community should not be interpreted as meaning there were no challenges for the model. There were at least two significant problems with the model - (1) the fossil record and (2) the human eye (as well as eyes of other creatures). The problem with the fossil record is the lack of transitional forms; if evolution has been happening for millions of years, we should be able to see fossil evidence of how individual species evolved, little by little. But what we find in the fossil record are many fossils of organisms with no apparent relationship to other organisms. This led to the popular scientific problem of "the missing link" (actually, a whole lot of links).

To address these "missing links," a new theory was developed by Stephen Jay Gould and Niles Eldredge. As Anderson summarizes:

Their theory, known as punctuated equilibrium, proposed that biological change occurred in isolated populations. During these periods of rapid evolutionary changes in small isolated populations, virtually no organisms would show up in the fossil record because their numbers were small and geographically isolated. Unlike the previous views of neo-Darwinian evolution, punctuated equilibrium predicts that biological change takes place in larger, more discrete jumps, and these would effectively be hidden from the fossil record (Anderson, p. 30-31).

It is interesting that the very evidence most people point to for support of Darwin's theory of evolution (the fossil record) is the problem which needs to be "explained away" by newer versions

of neo-Darwinian evolution. This may remind us of the many complicated explanations which were required to try to hold on to Ptolemy's geocentric model of the universe (see McGrath, p.18).

The second challenge for the model is the complexity of the human eye. Darwin himself was perplexed about how his model could explain the evolution of the eye. He had faith that with enough future research, his model could explain the evolution of the eye; but as Anderson points out:

Charles Darwin acknowledged in *Origin of Species*: "If it could be demonstrated that any complex organ existed, which could not possibly have been formed by numerous successive, slight modifications, my theory would absolutely break down." Darwin went on to add that he could find no such case that would refute his theory (Anderson, p. 82).

When Darwin developed his model, very little was understood about the structure of cells (compared to the current understanding). Behe (p. 6-10) discusses black boxes, devices whose inner workings are mysterious or incomprehensible. In Darwin's time, the cell was a black box, and because of limitations in technology, microscopes were not able to penetrate the mysteries of the cell. Behe notes: "The black box of the cell could not be opened without further technological improvements" (Behe, p. 10).

Perhaps Darwin should be excused for not anticipating the significance of the discoveries that would come with the technological advances in the twentieth century. The black box of the cell was opened, and what was inside led Behe to introduce the concept of *irreducible complexity*:

By *irreducibly complex* I mean a single system composed of several well-matched, interacting parts that contribute to the basic function, wherein the removal of any one of the parts causes the system to effectively cease functioning. An irreducibly complex system cannot be produced directly (that is, by continuously improving the initial function, which continues to work by the same mechanism) by slight, successive modifications of a precursor system, because any precursor to an irreducibly complex system that is missing a part is by definition nonfunctional (Behe, p. 39).

Based on Darwin's own words, the irreducible complexity of the cell causes his theory to "absolutely break down." As with previous models, the scientific establishment (with naturalistic presuppositions) is very resistant to changing models. A new model based on *intelligent design* is gaining momentum and as further research continues in the area of information theory, Darwin's model (based on Natural Selection) could possibly be enhanced or replaced by a new model based on Intelligent Design.

We should not conclude that Intelligent Design *proves* that evolution never happened; some proponents of Intelligent Design believe that evolution *did* occur. What Intelligent Design *does* conclude is that certain features in creation (like cells) could not have evolved by means of Natural Selection. Because of irreducible complexity, a Designer was needed. What we can say is that with further detailed analysis of extreme data (microscopically small), Darwin's model of evolution by Natural Selection is seen to be inadequate for the understanding of life; it is a model which needs to be refined (and perhaps replaced).

3.5 Summary

Models can be very valuable tools for scientists and mathematicians, but a model should never be equated with the actual phenomenon being modeled (remember the words of Box quoted in Section 3.1). Models are imperfect and frequently require revision (or replacement). When a scientific model seems to contradict a reliable source of information (such as the Bible), we should be hesitant in rejecting the other “reliable source,” because we have learned from experience that the scientific model will be refined (and the Bible will stand forever - I Peter 1:24-25).

4 Implications for Teaching, Faith and Learning

“All Scripture is God-breathed and is useful for teaching, rebuking, correcting and training in righteousness, so that the man of God may be thoroughly equipped for every good work.” (II Timothy 3:16-17)

4.1 Introduction

Mathematics is foundational in every area of life from financial management to computer security to project management and on and on, especially in the study of the natural sciences. A popular (though somewhat irreverent) adage says:

What is Biology? Applied Chemistry!
What is Chemistry? Applied Physics!
What is Physics? Applied Mathematics!
What is Mathematics? God?

Bradley and Howell summarize Galileo’s five properties of mathematics:

1. God has written the book of nature - which is the object of natural philosophy - in the language of mathematics.
2. Man can learn this language.
3. Man can “apply it to the study of nature” due to its logical structure.
4. Handled with care, this language cannot err or go astray.
5. This language is “not only the most certain epistemological tool, but” in fact is “the most perfect one capable of elevating the mind to divine knowledge” [but see Section 4.4 below] (Bradley and Howell, p. 23).

Since mathematics is truly the foundation of the natural sciences, there is the possibility for the temptation of a certain kind of arrogance for a mathematician. According to Pearcey and Thaxton:

By the end of the eighteenth century, mathematics had become an idol. In the scholarly world it was a matter of faith that the universe was a perfectly running perpetual-motion machine - a view that eliminated the need for God to do anything except perhaps start

it all off. In epistemology it became likewise a matter of faith that the axiomatic method led to universal and absolute truth - a view that eliminated the need for divine revelation (Pearcey and Thaxton, p. 137).

However, the Incompleteness Theorem of Kurt Gödel, mentioned earlier in Section 1.4, demonstrates that the mathematical foundation has some cracks. The cracks are so substantial that Pearcey and Thaxton entitled the seventh chapter in [17] “The Idol Falls.” Mathematicians should maintain an attitude of humility in the studying, learning and teaching of mathematics.

4.2 More About Models

As mentioned above, models can be very useful in representing various phenomena in the physical sciences. Models are also used in other disciplines such as economics, sociology, psychology, philosophy and even theology. The writer of the letter to the Hebrews seems to indicate that the old covenant is a model of a reality which is revealed by Jesus. The language used in Chapters 8-10 clearly implies that the old covenant is a model of a true reality revealed in the new covenant. The writer of Hebrews is trying to help his readers avoid the *confusion fallacy* mentioned above - confusing the model with real thing. And it is possible that one of the problems for the Pharisees during Jesus’s earthly ministry was that they were holding on to the model (the old covenant) and missing the real thing (Jesus; see John 5:39-47).

4.3 Models and the Authority of Scripture

Because a model is merely a representation of the genuine article, we must guard against the *confusion fallacy*; and we must also be careful about handling situations where the implications of the model appear to be inconsistent with other sources of information.

For example, an interesting (and somewhat troubling) situation occurs when a new scientific model is developed, which seems to describe a certain phenomenon very well, but when generalized to broader implications, provides results which are inconsistent with formerly reliable sources of information (like the Bible). Occasionally (in the past) theologians would employ creative hermeneutics to reinterpret (and perhaps misinterpret) Biblical passages to make scripture appear to be more consistent with the latest scientific *model de jour* while ignoring (or denying) the clear meaning of Scripture.

One possible response to science is to consider certain historical events as allegorical. For example, some theologians reject an historical interpretation for the Book of Jonah. As Grant Jeffrey notes:

The question all readers must confront is this: Are we to understand the account of Jonah and the great fish literally as an historical account? Or are we to interpret this biblical story as a simple myth or symbolic truth that is not based on the historic truthfulness of the underlying story?

Skeptics usually reject the story of Jonah and the great fish out of hand on the basis that they believe no known sea creature could possibly swallow a man whole, and the survival of such a man for several days is simply beyond the realm of possibility or of

human experience. However, the research ... reveals that both these assumptions are false (Jeffrey, 2002, p. 103-104).

He then goes on to identify (p. 109-110) “two documented historical accounts of people who were swallowed by whales and large fish and then survived the remarkable experience.”

So we see that additional scientific research, instead of strengthening the case against an historical interpretation of the Bible, actually confirms the historical interpretation. As Jeffrey observed elsewhere:

Only fifty years ago many disbelieving scholars totally rejected the historical accuracy of the Bible because they claimed that the Scriptures talked about numerous kings and individuals that could not be confirmed from any other historical or archaeological records. Recent discoveries, however, have shown that they should not have abandoned their faith in the Word of God so easily. If they had only trusted in the truthfulness of the Bible or waited a little longer they would have been rewarded with the recent archaeological discoveries that confirm many biblical details, events and personalities (Jeffrey, 1996, p. 71-72).

He then discussed recent archaeological discoveries confirming some biblical information (e.g. David’s kingdom, the walls of Jericho) which were previously considered fictitious by secular scholars.

The point to understand is that the Bible is reliable and can be trusted. We must remember two important facts: 1) Scientific models are imperfect and require frequent revision (and sometimes replacement), and 2) God’s Word is perfect and will stand firm forever (see, for example, Matthew 5:18; 24:35; II Timothy 3:16-17; I Peter 1:24-25). There may be many scientific, philosophical and theological reasons for holding various different interpretations of scripture passages; but our hermeneutics should not be dictated by apparent scientific facts based on imperfect man-made models. A different (and possibly superior) approach, as we suggested in Section 1.1, is to interpret the scientific models in light of what we know from Scripture (not the other way around).

4.4 Implications for Humility in Teaching Scientific “Facts”

Returning to Galileo’s five properties of mathematics as summarized by Bradley and Howell, we can accept the first three without reservation:

1. God has written the book of nature - which is the object of natural philosophy - in the language of mathematics.
2. Man can learn this language. This is why we study Mathematics.
3. Man can “apply it to the study of nature” due to its logical structure. This is why we study Science.

The fourth can be accepted if we emphasize the phrase “Handled with care”:

4. Handled with care, this language cannot err or go astray.

As we have seen, scientific models are not completely reliable and frequently require revision and/or replacement. This is not a bad thing. Because of frequent revisions, scientific models can be improved and more accurately describe the modeled phenomena. But we must maintain an attitude of humility as we present these models to students.

God has revealed Himself to us generally through nature and the natural laws that govern our universe; and we can learn about Him by studying mathematics and science. He has revealed Himself more clearly and more fully through His Word. So this leads to a departure from Galileo. His fifth property of mathematics was

5. This language is not only the most certain epistemological tool, but in fact is the most perfect one capable of elevating the mind to divine knowledge.

As the psalmist said: “To all perfection I see a limit; but your commands are boundless” (Psalm 119:96).

As valuable as mathematics is, it is not the “most perfect” for “elevating the mind to divine knowledge.” And as the writer of Hebrews indicated, the most complete revelation of God is found in Jesus Christ:

In the past God spoke to our forefathers through the prophets at many times and in various ways, but in these last days he has spoken to us by his Son, whom he appointed heir of all things, and through whom he made the universe. The Son is the radiance of God’s glory and the exact representation of his being, sustaining all things by his powerful word. After he had provided purification for sins, he sat down at the right hand of the Majesty in heaven (Hebrews 1:1-3).

Mathematics and science can provide valuable information about nature and about God, but the Bible provides more specific, and more perfect information; and the clearest revelation is found in Jesus. These observations should help us as we evaluate and prioritize the various sources of information and the resulting conclusions.

4.5 A Brief Personal Note

When teaching mathematics courses, I always begin the semester by reading and discussing Genesis 1:26-28, and then I remark that the study of mathematics is part of the task of subduing the earth. And to help facilitate an attitude of worship as we study mathematics during the semester, I frequently share a devotional and/or lead a worship song at the beginning of class. I also frequently remind the students that God’s Word is the only perfectly reliable source of absolute truth. This does not diminish the importance of studying mathematics and science; but it does provide a reliable framework in which to study the “book of nature” and interpret our conclusions.

5 More Observations About Hermeneutics

“Ah, Sovereign LORD! They are saying of me,

'Isn't he just telling parables?' ” (Ezekiel 20:49)

5.1 Hermeneutics - Biblical and Scientific

A current topic of discussion is the age of the universe. There is clear scientific evidence (based on currently accepted scientific models, based on currently accepted assumptions about the nature of space and time) that the age of the universe is between 13 billion and 14 billion years. This estimate is largely based on our understanding of the speed of light and observations of distant galaxies (and how long it takes for the light from the stars to reach earth). There is also clear Biblical evidence that the age of the universe is less than 10,000 years. This estimate is largely based on a literal reading of the first eleven chapters of Genesis. (There are several additional arguments in favor of each estimate.) The challenge is to reconcile the vast difference in these apparent age estimates. Various approaches have been suggested for addressing the conflict. Those who hold to a more literal interpretation of the Bible observe that God could “fill in” the light beams between the stars and the earth (after all, the stars would be useless if the light couldn't be seen). Those who hold to the older age estimate based on the scientific assumptions point out that the Hebrew word for “day,” *yom*, need not refer to a literal twenty-four hour day; in fact, the first three days were certainly not “solar” days since the sun was not created until the fourth day. An important observation in this discussion is that both the Biblical information and the scientific information are subject to interpretation.

Biblical hermeneutics is a fascinating and valuable discipline and a useful tool for understanding the depths of the treasures of Scripture. Klein, Blomberg and Hubbard discuss the importance of Biblical interpretation:

Hermeneutics describes the task of explaining the meaning of the Scriptures.... Interpretation is neither an art nor a science; it is both a science and an art.... Hermeneutics provides a strategy that will enable us to understand what an author or speaker intended to communicate (Klein, Blomberg and Hubbard, 2004, p. 4-6).

They also discuss some theories about the location of meaning in a text: in the text itself, in the mind of the reader, or perhaps some combination of the text and the reader.

They then identify four gaps which hermeneutics attempts to bridge (p. 13-16): (1) Distance of Time, (2) Cultural Distance, (3) Geographical Distance and (4) Distance of Language. By better understanding the various components of context (time, culture, geography and language), we can experience new and fresh depths of understanding of God's Word.

John Wesley's view of Scriptural interpretation is summarized by Weeter (2007, p. 194):

Wesley delineates this principle quite clearly when he states in a letter to Samuel Furley in 1755:

“The general rule of interpreting Scripture is this: the literal sense of every text is to be taken if it be not contrary to some other texts. But in that case, the obscure text is to be interpreted by those which speak more plainly.”

Weeter goes on to clarify (p. 195) that even though Wesley clearly advocated interpreting Scripture literally, he acknowledged that the Bible contains figurative language and symbolic passages; but

his position was that we should begin with the literal meaning as a foundation, and then identify the spiritual meaning, the application.

To summarize then, John Wesley advocated for a literal interpretation of Scripture unless such interpretation causes a contradiction with a more clearly understood passage.

5.2 Biblical Examples Incorrectly Rejecting Literal Interpretation

At the beginning of John Chapter 3, we are introduced to Nicodemus. Nicodemus acknowledged that Jesus came from God. But later in Chapter 7, he was faced with a dilemma: Jesus came from Galilee, but Scripture clearly taught that the Messiah would come from Bethlehem (Micah 5:2).

To resolve his dilemma he (apparently) chose to interpret Micah 5:2 figuratively; since Jesus was a descendant of David, and David came from Bethlehem, we could say that Jesus came from Bethlehem (even though he actually came from Galilee).

But Nicodemus would have had no dilemma if he had done more research (like Matthew and Luke did) and found that Jesus was, in fact, born in Bethlehem. But because of his lack of information, he incorrectly adopted a figurative interpretation of Micah 5:2 when a literal interpretation would have been correct.

So also, we should be hesitant to reject a literal interpretation, because even though we may believe our information to be complete, it may not be.

Another example is Peter. Peter is one of the most fascinating characters in the Bible. He sometimes experienced significant victories and made great declarations, and he sometimes experienced significant failures and made great blunders. One of his finest moments is recorded in Matthew 16:16: “You are the Christ, the Son of the living God.” Jesus confirmed that Peter was correct in his declaration. Then (v. 21) Jesus described his upcoming suffering and death. This caused a problem for Peter; he knew Jesus was the Messiah, but now Jesus is talking about suffering and death. Jesus often spoke in parables; perhaps this is one of those times. He certainly cannot be speaking literally. Peter’s perplexity became so severe that he actually rebuked Jesus; and Jesus’s reply is found in verse 23: “Get behind me, Satan! You are a stumbling block to me; you do not have in mind the things of God, but the things of men.” Because of Peter’s lack of understanding, he adopted a figurative interpretation when a literal interpretation was appropriate. Eventually (after Pentecost) Peter understood that Jesus’s suffering and death were part of God’s plan for redemption (see Acts 2:23). So again we see that additional information supports a literal interpretation.

5.3 Conclusion

Just as Scripture is subject to interpretation, so also are scientific results. As mentioned above (see [13]), meaning may be (at least partly) created by the reader of the text. So also in scientific investigations, the researcher projects meaning upon the results of the scientific study, such meaning largely influenced by the worldview of the researcher. In light of these observations, much care (even hesitance) should be used in adopting a non-literal interpretation of Scripture if the only reason for such interpretation is the result of a scientific study, or a lack of available information. As we have

seen, very often additional information supports a literal view of Scripture. God can be trusted to mean what He says.

As a possible caveat, we should acknowledge that what we understand as “literal” may change from time-to-time with shifts in cultural attitudes or prevailing worldviews. In addition to what we mentioned in Section 4.1, an attitude of intellectual humility is necessary in science and in Biblical interpretation. The point we wish to emphasize is that if a certain passage of scripture seems to require a symbolic or figurative interpretation, it is possible (perhaps highly likely) that more information will indicate that a literal interpretation is appropriate.

6 The Nature of Space - Toward a New Model

*“The heavens declare the glory of God;
the skies proclaim the work of his hands.” (Psalm 19:1)*

6.1 How Old is the Universe?

In this section, we return to the question we addressed in Section 5.1. As we mentioned, there is scientific evidence to support either a young universe (thousands of years) or an old universe (billions of years). We will certainly not resolve this issue, but we may make a small contribution to the discussion. The approach we suggest may be considered somewhat unique in that we will begin with what the Bible says and then propose a different cosmological model. But first, we will review some concepts from topology.

6.2 Topological Considerations

We will begin with some basic Analytic Geometry. A circle is defined as the set of points in a plane which are equidistant from a given point, called the *center*. Algebraically, in the *Cartesian Plane*, we define the *unit circle*, centered at the *origin*, by the equation

$$x^2 + y^2 = 1.$$

The unit circle is a *one-dimensional* concept embedded in a *two-dimensional* concept - the plane.

We can compare this with the *unit disk*, centered at the origin, in the plane, which is given by the inequality

$$x^2 + y^2 \leq 1.$$

The unit disk is a two-dimensional concept. The unit circle is the one-dimensional *boundary* of the two-dimensional unit disk.

Let's move up one dimension. The *unit sphere* is defined by the equation

$$x^2 + y^2 + z^2 = 1.$$

The *unit sphere* is a two-dimensional concept embedded in three-dimensional space. We can compare this with the *unit ball* which is given by the inequality

$$x^2 + y^2 + z^2 \leq 1.$$

which is a three-dimensional concept. The unit sphere is the two-dimensional boundary of the three-dimensional unit ball.

We can continue with examples like this for higher dimensions, but the concepts and the terminology quickly become quite complicated. The study of *manifolds* in Topology addresses many properties of these ideas. The $(n - 1)$ -dimensional surface of an n -dimensional object is an example of a manifold. We will not go further into the details here except to note that modern cosmological models consider our universe to be like a three-dimensional surface (manifold) in four-dimensional space. We will keep this in mind as we consider some features of a balloon in the shape of a sphere.

6.3 An Expanding Sphere

Consider a balloon in the shape of a sphere. Suppose there is a snail moving along the surface of the balloon. This snail is rather fast for snails - it can move at the high rate of one inch per minute. This velocity is well-established and cannot be exceeded. Now suppose the balloon begins expanding very quickly. A few minutes later, we observe that the snail has moved a total of ten inches from its original position. We conclude that ten minutes have passed, because the “speed of snail” is one inch per minute, and that speed cannot be exceeded. However, an independent observer has informed us that only two minutes have passed. Who do we trust: our knowledge of basic physics, or the independent observer? Because of the expansion of the balloon, our ability to draw conclusions from our observations has been compromised. We know the “speed of snail” and we can see how far the snail has traveled; but the expansion of the balloon has complicated our calculation of elapsed time. The snail was moving at one inch per minute, but because the *medium* (through which the snail was traveling) was stretching, the *apparent* elapsed time was much greater than the *actual* elapsed time. If we are not aware of the expansion of the balloon, we need help from the independent observer to help us determine the actual elapsed time.

6.4 An Expanding Universe

Modern cosmological models accept that our universe is expanding, and that it has been expanding since the moment of the Big Bang. We also understand from Einstein’s Theory of Relativity that space can be bent, or curved, by strong gravitational forces. So a possible question to consider is: “Can space be *stretched*?” And is it possible that the complications we encountered with the snail could also complicate our calculations about elapsed time?

There are several Bible verses referring to God *stretching out the heavens*. A few are:

1. Isaiah 42:5
2. Isaiah 44:24
3. Isaiah 45:12

4. Jeremiah 10:12

5. Jeremiah 51:15

We acknowledge that the interpretation we present here for *stretching out the heavens* is not traditional, and we could be accused of speculation and creative hermeneutics; however, since modern cosmological models recognize that the universe is expanding, and since models also recognize that our universe can be considered a three-dimensional manifold in four-dimensional space, the idea of space being *stretched* does not appear to be far-fetched.

If space can be stretched, and if space was, in fact, stretched very rapidly at the moment of the Big Bang, it is likely that our estimates of the time elapsed since the Big Bang would be greatly exaggerated. We need guidance from an Independent Observer if we want to know how long ago the Big Bang happened, and we have One!

6.5 Conclusion

Much more could be said about the relationships between *time* and *expanding space*. The idea that time is *relative* is certainly not new here. At velocities close to the speed of light, the measurement of time can be distorted. The question posed here is whether the stretching of space may also distort the measurement of time. Before the implications of the ideas in this section can be adopted, more research is needed. I am not suggesting that the ideas presented here will resolve all of the apparent conflicts about the age of the universe. But I do want to emphasize that the Final and Perfect Cosmological Model does not yet exist. The search for a Grand Theory of Everything, unifying Quantum Field Theory and General Relativity, has been elusive. And while we should all maintain an attitude of intellectual humility, I would like to suggest (emphatically) that as models get better and better, we may find that a literal reading of the Bible was the best interpretation all along.

7 Conclusion - The Pursuit of Truth

“Then you will know the truth, and the truth will set you free.” (John 8:32)

7.1 We Can Know the Truth

Mathematics and science are valuable resources for understanding how the universe works. We should not approach these subjects with fear and trepidation, fearful that they will undermine the authority of Scripture. We do not need to be afraid of the truth. But neither should we bow at the altar of methodological naturalism for the only proper interpretations of scientific information. Rightly interpreted, scientific results and Scripture will be in harmony; all truth is God’s truth.

We study mathematics and science, and we obtain valuable information. The scientific revolution, the industrial revolution, and more recently, the information revolution all happened because old scientific models were replaced by newer models with new underlying assumptions - all because somebody studied mathematics and science. But as the past is a clue to the future, these present models, with their assumptions (and with all the success they generated) will eventually be replaced

by newer, more complete, models. But we should never expect to acquire a completely perfect scientific model. The only perfect source of information is the Bible.

As we mentioned in the Introduction (Section 1.4), God is extending a wonderful invitation: “Come now, let us reason together.” We have many resources available as we endeavor to discover the truth. One of those resources is our God-given ability to reason - and to learn mathematics and science. But the greatest resources God has given are His Word and His Son. As we diligently pursue the Truth, He has promised that He will help us, and He has guaranteed our success.

“You will seek me and find me when you seek me with all your heart.” (Jeremiah 29:13)

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