

A Christian Physicist?

Can a committed Christian seriously engage in the study of physics? I certainly chose to. My thirst for knowledge of this world only grew stronger after committing myself to Christ and growing in my faith throughout my teenage years. Choosing to attend a small Christian college, I was drawn to physics for its explanatory power in describing our world. Several former students of my favorite physics professor expressed this well in their recollections of how physics served to open up to them a new way of seeing the world. One student wrote of his first class in physics, “Dr. Graziano began by integrating $F = ma = m (dv/dt)$ vectorily and the world changed for me. Suddenly, things that I took for granted had a reason for their happening.”¹ Indeed, physics helped us make sense of the world, serving as a mental tool to facilitate our investigation into unlimited phenomena ranging from the microscopic realm of subatomic particles to the macroscopic extent of the cosmos. All appeared to be governed by laws that we could understand and apply. Those brief undergraduate years were followed by a couple of intense graduate level years, allowing me to then join researchers on the cutting edge of the field of elementary particle physics. However, the question of how physics relates to my faith had only just begun and has taken the better part of a lifetime to explore and appreciate.

My faith would be put to the test as a graduate student, when I was required to read a book on cosmology called “The First Three Minutes”² by Nobel Prize winning physicist Steven Weinberg. The book was written at a popular level, with few equations. It cogently argues why a hot, explosive beginning to our universe leads to clear explanations for what we observe today, including the fact that our universe is nearly three-quarters Hydrogen and one-quarter Helium by mass, and only 1% all heavier elements. Many other important observations strongly support a model of an expanding universe we now call the “Big Bang” theory. The line of reasoning is accessible to anyone willing to follow the arguments. It doesn’t take a genius like Weinberg to understand it. The only thing that troubled me is the introduction, where Weinberg uses the example of a humorous Norse myth of origins to make a point that religious explanations are not very satisfying and that science is just beginning to provide satisfying answers on origins. While Weinberg was careful to avoid any statements openly derisive of religious faith, he still gave the impression that religious explanations are a relic of our superstitious past, ripe to be replaced by the progress of trustworthy science. Did I really have to choose between science and my faith?

According to several high profile modern physicists-astronomers, famous for their work in explaining science on a popular level, growth in scientific understanding should lead to a weakening of faith in God. The late Carl Sagan (Cosmos) and his successors in Stephen Hawking (A Brief History of Time), Victor Stenger (God: The Failed Hypothesis), Lawrence Krauss (A Universe from Nothing), and Neil deGrasse Tyson (Death by Black Hole) have all agreed with Steven Weinberg that science offers no support for belief in God. Weinberg, troubled by the persistence of religious faith in the USA, no longer worries about offending religious sensibilities as he once did. He recently expressed his belief that the advance of science is leading to the demise of religious belief, pointing to the trend seen in Europe. In his recent New York Review article he lists four sources of tension between religion and science in general and offers advice on how we will learn to live without God once we realize belief in God is unnecessary.³ With such prominent credentials and a gift for explaining highly technical aspects of science in accessible

¹ Dana “Woody” Hobson Jr. testimonial, Dr. William Graziano Retirement Album, Baker University, May 1, 1999.

² Steven Weinberg, “The First Three Minutes: A Modern View of the Origin of the Universe”, Basic Books, 1988.

³ Steven Weinberg, *‘Without God’: An Exchange* The New York Review, November 20, 2008

terms, it may be tempting to accept his view that science steadily removes faith. Indeed, in a post-modern society like ours, how can one argue that one religion is any better or more “true” than another? This has powerful sway, especially if science is the one “language” that speaks the most sense to us.

However, if our prior faith commitment does not permit us this view, what other options do we have? Aggressively campaigning for the allegiance of the faithful, creationists offer an alternative. Claiming to stand firmly on the side of biblical truth while casting doubt on the validity of prominent scientific theories, creationists insist that God created the world and the cosmos approximately 6000 years ago, pretty much like we see it today. There are some Ph.D. scientists such as Russell Humphries (Starlight and Time), Donald DeYoung (Astronomy and the Bible), and Jason Lisle (Taking Back Astronomy: The Heavens Declare Creation) who argue both the Bible and science support such a young universe, but the most visible creationist remains Ken Ham (Answers in Genesis, The Creation Museum), whose formal scientific training is limited to a bachelors degree. Claiming that the Bible is the only completely trustworthy source of information on the age of the universe, he nonetheless boldly asserts that “literally hundreds of dating methods could be used to attempt an estimate of the earth’s age, and the vast majority of them point to a much younger earth than the 4.5 billion years claimed by secularists.”⁴ Clearly not after any diplomacy awards, Ken Ham and his fellow creationists have apparently been effective in influencing the average US citizen. According to recent Gallup polls⁵ nearly half of all US citizens believe in a young-earth creation model.

However, the “secularists” Ken Ham refers to happen to include the vast majority of scientists, whether unbelievers or believers like me⁶. I have yet to come across any scientific dating methods that favor a young earth or cosmos, contrary to Ham’s bold claim, and I have read several creationist books. My exposure to young-earth creationism intensified when I left the field of elementary particle physics and began teaching in a Christian college setting. Some students come to college prepared to defend biblical teachings and have not yet differentiated central core doctrines of the faith from less certain ones. Just a few years ago, a concerned student gave me a copy of “Thousands...Not Billions”, a collection of articles by the RATE⁷ team of creationists, with personally signed notes to me from each of seven contributing authors. I appreciate their thoughtful gesture. And it is not my wish to critique their work here. In fact, I have no axe to grind. I have to deal sensitively with students and faculty members who favor young-earth creationism, most without having seriously examined the basis for it. While I do strongly encourage a careful examination of the basis for beliefs, my only aim here is to encourage those wishing to explore how physics and faith can fit together without doing damage to one or the other. Alas, when interested believers begin looking into the evidence it is inevitable that they will discover, contrary to the claims of creationists, that the science of the prominent atheistic scientists actually forms an accurate model of reality. Will acceptance of these scientists’ theology (or lack thereof) follow? It is my hope that believers find a better way to cope with this realization, and learn that valid science can actually fit well with biblical faith.

⁴ Answers: The 10 Best Evidences from Science that Confirm a Young Earth, Oct-Dec 2012.

⁵ Gallup Poll 2012: <http://www.gallup.com/poll/155003/Hold-Creationist-View-Human-Origins.aspx>

⁶ Among members of the American Scientific Affiliation, 86% of these Christian scientists accept that the universe is 14 billion years old and 83% accept that the Earth is 4.6 billion years old, ASA Member Survey, June 1, 2010.

⁷ Radioisotopes and the Age of the Earth project, Donald DeYoung, editor “Thousands...Not Billions”, Master Books, 2005.

How far adrift from the thoughtful considerations of prominent scientists and theologians through the centuries have we easily come! More now than ever do we need to hear that devout believers have long wrestled with questions of science and faith and many concluded that science and faith are more than compatible; they both shed insight on the meaning and purpose of our existence. Far from excluding God, science has revealed to us an elegant universe that poignantly begs the question of a causal reality beyond the purview of science, one that faith addresses. Most of the recent forays of prominent atheistic scientists into the realm of science and faith pale as shallow and superficial in contrast to how many of the earliest scientists approached science and faith questions. Likewise, the bold sweeping claims of creationists, while popular in many Christian churches, fail to adequately address the deep connection of science and faith, while recklessly castigating science and scientists as hopelessly wrong. It is time to stop this needless fight with no victors and rediscover how both science and faith can meaningfully fit together as it did for many of the early contributors of modern science.

Biblical authors from antiquity considered nature as a witness to God's handiwork. The psalmist wrote "The heavens are telling of the glory of God; and their expanse is declaring the work of His hands."⁸ Yet the study of nature as an independent source of truth from Scripture only began in earnest in the Judeo-Christian culture in the 12th century C.E. Theologians such as Moses Maimonides (1135-1204) and St. Thomas Aquinas (1225-1274) offered ideas that are still influential today. Aquinas' 5 proofs for God's existence represent an attempt to draw logical conclusions from the existence of the natural world, laying the foundations of natural theology.⁹ According to science historian Peter Harrison, Christian theologians began to think of nature as another source of revelation to be studied and interpreted, similar to Scripture, only after moving beyond the Augustinian emphasis on the spiritual meaning of both Scripture and nature.¹⁰ This embracing of the literal meaning of both was accompanied by a revived interest in Plato's ideas on how patterns in nature reveal the mind of God. "It was this combination of the meaning and intelligibility of the cosmos which led to the recognition that nature could be regarded as a book."¹¹

The idea of two books, Scripture and nature, was developed by Sir Francis Bacon (1561-1626), who first articulated the process whereby we "read" the book of nature, known today as the scientific method. This method starts with systematic observation of nature, in contrast to the ancient Greek tendency to rely upon logic alone. The goal is to find out how nature actually works, not how it "ought" to work. Seeking a general explanation involves proposing a testable hypothesis. Clear predictions lead to experiments that can serve to confirm the idea, or to expose its flaws. Either way, the method allows for continued improvement in understanding, leading to the development of models or theories with explanatory and predictive power. Likewise, more importantly, it allows for the discarding of models that fail to accurately explain or predict. A central assumption to the method is that we live in an orderly world intrinsically governed by principles that can be discovered and understood by humans.

Bacon recognized the significance of being part of a new era in which he and his contemporaries were surpassing the knowledge of the ancients, and that it could easily lead to arrogance. What preserved his sense of humility was his belief that this new method of discovering truth did not usurp the Bible. Like several of the early founders of modern science, Bacon saw no real conflict between the truth revealed by

⁸ Psalm 19:1, New American Standard Bible, The Lockman Foundation, 1977.

⁹ St Thomas Aquinas, *Summa Theologica*, <http://www.sacred-texts.com/chr/aquinas/summa/index.htm>

¹⁰ Peter Harrison, *The Bible, Protestantism, and the Rise of Natural Science*, Cambridge University Press, 1998.

¹¹ *Ibid*, Harrison, p.44.

Scripture and truth revealed by nature. He viewed them both as God's two books of revelation. In his "The Advancement of Learning" he wrote,

"To conclude therefore, let no man upon a weak conceit of sobriety or an ill-applied moderation think or maintain, that a man can search too far, or be too well studied in the Book of God's Word, or in the Book of God's Works—Divinity or Philosophy. But rather, let men endeavour an endless progress or proficiencie in both."¹²

While it might appear today that men like Bacon were cultural Christians, strongly tied to the prevailing religious notions of the time, in fact he chose to speak out against a rise in atheism. In countering his contemporaries who used the new ideas in philosophy to cast aside religious belief, Bacon responded "It is true, that a little philosophy inclineth man's mind to atheism; but depth in philosophy bringeth men's minds about to religion."¹³ Bacon's four leading causes of atheism seem appropriate to our modern society. Doctrinal divisions, scandals, and profane attitudes among believers all certainly provide plenty of reasons for atheists to reject God today and fodder for the diatribes of militant atheists like Richard Dawkins (*The God Delusion*) and Christopher Hitchens (*God is not great*). However, Bacon's fourth reason for atheism is most pertinent to our discussion of physics and faith.

"And lastly, learned times, specially with peace and prosperity; for troubles and adversities do more bow men's minds to religion. They that deny a God, destroy man's nobility; for certainly man is of kin to the beasts, by his body; and, if he be not of kin to God, by his spirit, he is a base and ignoble creature."¹⁴

It is noteworthy that all of Weinberg's recently stated four sources of tension between religion and science are based on the "learned times" we are in, when science is replacing the explanatory power and authority of religion. Weinberg mentions that he cannot prove any of his assertions, humbly stating "I want just to offer a few opinions, on the basis of no expertise whatever".¹⁵ However, he proceeds to make the case that science has left no ground for religion to stand on. The fundamental assumption Weinberg appears to make is that a scientific explanation eliminates God's involvement, a common assumption on both sides of this issue. Yet this assumption was widely rejected by the early founders of modern science and must be rejected by anyone wishing to take seriously the integration of science and faith today. Just as accepting that Scripture involved human authors does not eliminate the inspiration of God, accepting a scientific explanation for nature does not eliminate the superintendence of God.

Several of Bacon's contemporaries and immediate successors shared similar views on the compatibility of science and Scripture, that one does not trump the other. To them, truth can be found in both sources independent of the other, but should be consistent. Our imperfect understanding of both implies that conflict is inevitable. Copernicus, Galileo, Kepler, Newton, Pascal, and Boyle all witnessed tensions presented by science to traditional belief, but found ways to reconcile science and faith. One of the most well-known conflicts involved Galileo Galilei (1564-1642), in his support for the Copernican heliocentric view. During his personal conflict with the Catholic Church over whether the Sun or the Earth moved,

¹² Francis Bacon, *The Advancement of Learning*, 1605, ebooks.adelaide.edu.au/b/bacon/francis/b12a/index.html

¹³ Francis Bacon, *The Essays or Counsels, Civil and Moral*, Ld. Verulam Viscount St. Albans.

¹⁴ *Ibid*, Bacon, *The Essays or Counsels*.

¹⁵ *Ibid*, Weinberg, "Without God".

Galileo stressed that passages on the immovability of the Earth should not be used to infer that the Earth is literally stationary. Galileo argued that “the Bible tells us how to go to heaven, not how the heavens go.”¹⁶ Accordingly, science offers insight for understanding the book of nature, which is just as much a divine gift as the book of Scripture.

Regarding the pitfalls in properly interpreting Scripture, Galileo proposed that science offers a valuable interpretive aid. In reconciling apparent contradictions between Scripture and science, Galileo reiterated the Augustinian principle of accommodation; that certain passages of Scripture “were set down by the sacred scribes in order to accommodate them to the capacities of the common people, who are rude and unlearned.”¹⁷ It was unnecessary for the Bible to be written in “correct” scientific language in order to communicate the eternal truth of the gospel. Thus for Galileo, science did not present a threat to the truth of the Scriptures, but merely to faulty uses and interpretations of it. His reasoning follows Augustine (354-430), who dealt with this same issue long before the scientific revolution. Augustine wrote “in the matter of the shape of heaven the sacred writers knew the truth, but that the Spirit of God, who spoke through them, did not wish to teach men these facts that would be of no avail for their salvation.”¹⁸

Whether or not the sacred writers knew the truth about scientific facts also appears to be unimportant. This is a thorny issue today, since acceptance of the divine inspiration of Scripture for some implies complete literal accuracy in all matters, whether historical, geographical, or scientific¹⁹. However, even in accepting inerrancy, we should be cautious about what kind of inerrancy we are defending, that of Scripture or that of interpretation. Extracting historical, geographical and scientific information from the Scriptures often involves interpretation, met by varying degrees of agreement among Bible scholars. As Galileo argued, we need to be reverent in our use of Scripture and seek to understand its intent, placing greater emphasis on the clear and consistent messages than the interesting cultural venues and personalities through which they were communicated. Even the apostle Peter, in addressing Paul’s letters, wrote “His letters contain some things that are hard to understand, which ignorant and unstable people distort, as they do the other Scriptures”²⁰. Scripture itself admits the personality of the human author is interwoven together with the divinely inspired Word. This should serve as a note of caution to us today in our use of Scripture. Like Augustine and Galileo, we can fully accept that Scripture is “God-breathed”²¹, but also try to avoid taking unintended messages from it that may just be part of the medium for the real message. As Christ is the incarnation of God, so the Word of God comes to us through the vessel of human frailty. A healthy and reverent view of Scripture recognizes both God’s inspiration and the personality and cultural conditioning of its human authors.

Though early scientists were willing to accept an accommodation of Scripture, written to give us truth but not scientific knowledge, finding a good fit between science and faith was still not easy. Isaac Newton (1642-1727) struggled with how divine input and natural law could coexist. His pivotal formulation of the three laws of motion and the universal law of gravitation led to the idea of a clockwork universe, in

¹⁶ Galileo, Letter to the Grand Duchess Christina, people.bu.edu/dklepper/RN242/duchess.html

¹⁷ Ibid, Galileo.

¹⁸ Augustine, *Literal Meaning of Genesis*, Bk. II, ch. 9; 1:59.

¹⁹ “*Inerrancy*”, edited by Norman L. Geisler, Zondervan, 1980, a defense of the 1978 Chicago Statement on Biblical Inerrancy.

²⁰ II Peter 3:16, New American Standard Bible, the Lockmann Foundation, 1977.

²¹ II Timothy 3:16

which nature could be understood on the basis of natural forces and principles. Newton wrestled with how God worked in this mechanical universe, whether through natural forces or directly. The interchange between Newton and Gottfried Wilhelm von Leibniz (1646-1716) illustrates an approach known today as “God of the gaps”, as recounted by astronomer and science historian Owen Gingerich. When faced with trouble explaining how gravitational perturbations from planets would not greatly disturb other planetary orbits, “Newton decided that God’s continuing care would be required to prevent the planets from running wild...Leibniz replied that it was a mean notion of the wisdom and power of God which would imply He could not have gotten the universe right in the first place. Leibniz added, 'I hold that when God works miracles, he does not do it in order to supply the wants of nature, but those of grace.'”²²

The expression “God of the gaps” was first coined by evangelist Henry Drummond (1851-1897), who argued for a far more encompassing hand of God in his work “Natural Law in the Spiritual World”²³ Drummond claimed that God’s involvement extends to the natural laws that appear to govern nature. Today, scientists, including believers, overwhelmingly reject “God of the gaps” belief for the same reason. As soon as a reasonable scientific explanation emerges, the “God of the gaps” God disappears. Certainly faith based upon a disappearing God cannot long endure the advances of science. Either one retreats into a denial of the science while promoting a “biblical” based version of science (creationism) or one gives up belief in God like Weinberg claimed. These appear to be the only choices open to those who make the assumption that scientific explanations eliminate God from the picture.

This assumption is common in recent popular science books. Neil deGrasse Tyson includes an entire section on Science & God in his book “Death by Black Hole”, in which belief in God is placed in this uncomfortable shrinking corner. Concerning the early scientists he writes “They appeal to a higher power only when staring into the ocean of their own ignorance. They call on God only from the lonely and precarious edge of incomprehension. Where they feel certain about their explanations, however, God gets hardly a mention.”²⁴ Newton’s “God of the gaps” appeal and a few other examples are presented as support for his premise, but Tyson fails to mention any of the discussions of the early scientists in which God is invoked, not in respect to mysteries still unexplained, rather because of the marvel that the universe appears to be governed by rules they were discovering. Johannes Kepler (1571-1630) in particular saw his contributions in astronomy as his role in demonstrating God’s supremacy. His three empirical laws of planetary motion transformed astronomy into an accurate and predictive science. In reflecting on his work, Kepler wrote to his former teacher Michael Maestlin, “For a long time I wanted to be a theologian; for a long time I was restless. Now, however, behold how through my effort God is being celebrated in astronomy!”²⁵

Indeed, several of the early scientists viewed their work in this way, including Robert Boyle (1627-1691), considered one of the founders of modern chemistry. Boyle emphatically promoted the idea that scientific explanations fit well with belief in God. He coined the expression “clockwork universe”, based

²² Owen Gingerich, “God’s Universe”, President and Fellows of Harvard College, 2006, p. 45.

²³ Henry Drummond (1894). *Natural Law in the Spiritual World*. Hodder and Stoughton (reissued by [Cambridge University Press](#), 2009.

²⁴ Neil deGrasse Tyson, “Death by Black Hole and Other Cosmic Quandaries”, W.W. Norton & Co., 2007, p. 353.

²⁵ October 3, 1595, in “Johannes Kepler Gesammelte Werke”, vol. 13 (Munich, 1945), 23:256-257; from Gerald Holton, “Johannes Kepler’s Universe: Its Physics and Metaphysics,” *American Journal of Physics* 24 (1956): 340-351, recounted in Owen Gingerich, “God’s Universe”.

on the powerful predictability of Newtonian physics. In doing so, he argued against the notion of an organic universe, subject to the whims of unpredictable deities, in favor of an orderly universe subject to predictable rules or principles. In Boyle's view, this placed a more appropriate emphasis on God's role as creator and sustainer of a rational universe. That humans could deduce the rules that govern the universe demonstrates that God created humans in His image, making all of nature subject to our dominion. Far from removing God from the picture, for Boyle science serves to elevate man to his rightful place in God's creation, helping to regain some of what was lost in the fall, fulfilling the creation mandate of God. Boyle wrote "Natural philosophy is reasonable worship of God... and discovering to others the perfection of God displayed in the creatures is a more acceptable act of religion, than the burning of sacrifices"²⁶

However, the practice of science is not deemed by all as an act of worship, even among believers. Some view science as trespassing on sacred territory in its attempts to explain some mysteries reserved for God's hand alone. The modern Intelligent Design movement is a recent extension of natural theology in its attempts to prove God, but ironically ID proponents do not wish to mention God. The ID goal is to find evidences for intelligent design in nature, but also to avoid the appearance of religion in an attempt to qualify as science. The Dembski filter was proposed by mathematician, philosopher William Dembski in his book *The Design Inference*²⁷ as a way of demonstrating the existence of an intelligent designer. By demonstrating that neither chance nor known law provides sufficient explanations for the order we observe in nature, we are then left with intelligent design as the best explanation, according to Dembski. Although Dembski is a fellow believer, I must agree with Neil deGrasse Tyson on this point. Most scientists I know feel an aversion to the Design Inference, since it is precisely the explanatory power of science that attracted us to science in the first place. The goal of the scientist is to find plausible scientific explanations to explain the mysteries in nature. To conclude that there is none, other than a miraculous work of God, is contrary to the aim of science.

As a believer I want to see how God is present in the things that science helps me to understand, not just in the mysteries that do not yet have any clear scientific explanation. Why should God's involvement be limited to the things science cannot explain? My God is not the "god of the gaps", but rather the Author and Creator of the natural laws and whose handiwork can be seen in all of nature, especially when science provides a good explanation for its behavior. A growing number of modern scientists, even agnostics, acknowledge a place for faith that is compatible with science. Physicist Paul Davies agrees that "The God of scholarly theology... is cast in the role of a wise Cosmic Architect whose existence is manifested through the rational order of the cosmos, an order that is in fact revealed by science. That sort of God is largely immune to scientific attack"²⁸. Davies further elaborates "Design-by-laws is incomparably more intelligent than design-by-miracles."²⁹ Allowing that God works through natural laws, implementing His subtle design in a way consistent with the laws He ordained, opens a view on the magnificence of God's infinite wisdom and does not diminish our view of God's power.³⁰ For this reason, a confident faith based on a personal relationship with the God of the Bible has nothing to fear from science.

²⁶ Boyle, *Some Considerations*, in *Works*, II, recounted in Harrison "The Bible, Protestantism, and the Rise of Natural Science", p. 198, Cambridge University Press, 1998.

²⁷ William Dembski, *The Design Inference*, Cambridge University Press, 1998.

²⁸ Paul Davies, "The Goldilocks Enigma: Why is the Universe Just Right for Life?", p.15, Mariner Books, 2006.

²⁹ *Ibid*, Davies, p. 199.

³⁰ John Polkinghorne, "Science and Providence", SPCK, 1989.

Some believers may not find this entirely satisfying. By focusing on the explanatory power of science we may not have “proof” of God in any sense of the word, thus moving away from the sort of natural theology begun by Aquinas long ago. If science explains the operation of the physical universe does God become superfluous? There are certainly differing views on this question. Carl Sagan famously stated in his first line of *Cosmos*, “The Cosmos is all there is or ever was or ever will be”³¹, reminiscent of the words of Christ who said “I am the Alpha and the Omega, who is and who was and who is to come, the Almighty”.³² For Sagan the cosmos stands on its own, but believing scientists all agree that science gives us a woefully incomplete view of the world. Science gives us truth, but cannot give complete truth. The faith of the believer is a crucial part of the overall view. Blaise Pascal (1623-1662), mathematician, physicist and philosopher, articulated how nothing, including science, could fulfill a deep-seated longing within us. Of our desire for happiness and our inability to find it in this world he wrote:

“What is it then that this desire and this inability proclaim to us, but that there was once in man a true happiness of which there now remain to him only the mark and empty trace, which he in vain tries to fill from all his surroundings, seeking from things absent the help he does not obtain in things present? But these are all inadequate, because the infinite abyss can only be filled by an infinite and immutable object, that is to say, only by God Himself.”³³

Pascal concluded that the remarkable explanatory power of science cannot fill our deepest need, only God can. Believing scientists continue to reaffirm Pascal’s conclusion today.

While science cannot fill that deep-seated longing, it can and does enrich our lives. Robert Boyle found that science offered new perspectives on faith. For Boyle, the advent of experimental science over Greek logic mirrored how the gospel was delivered through the unlearned apostles rather than the learned religious leaders and philosophers. In both cases, the observable facts were borne out by the former, whereas the latter offered only vain speculation. Boyle did not see new scientific findings as removing God, rather as new revelations of truth just as the incarnation of Christ revealed truth.³⁴ Accordingly, for Boyle, science does not remove or replace faith. They are allies in the quest for truth. Indeed, the method of science can enhance faith, since the factual basis of each is emphasized. For science the factual basis is revealed by experiment. For faith the factual basis is revealed by the empty tomb, the testimonies of the apostles to the resurrection of Jesus Christ, and the transformed lives of his followers. It is the factual basis of each that compels us to accept each as true.

Today, physics has progressed far beyond the 17th century state of the art. Optics, thermodynamics, and electromagnetic theory all proved to be highly explanatory as did Newtonian gravity. The 20th century was a period of revolutions in our understanding of space, time, matter and energy. Newtonian gravity, highly successful in explaining planetary and lunar motion, turned out to be the weak field limit of Einstein’s general relativity, which accurately models gravity even in strong fields. The preciseness of

³¹ Carl Sagan, “*Cosmos*”, p. 4, Random House, 1980.

³² Revelation 1:8, New American Standard Bible.

³³ Pascal’s *Pensées*, #425, The Project Gutenberg Ebook, Produced by John Hagerson, LN Yaddanapudi, and Juliet Sutherland, http://www.gutenberg.org/files/18269/18269-h/18269-h.htm#SECTION_II.

³⁴ Reijer Hooykaas, “*Religion and the Rise of Modern Science*”, Regent College Publishing, 2000, p. 48, reprinted from the original version by Scottish Academic Press, 1972.

Newtonian laws also failed to hold true in the microscopic realm, where the probabilistic approach of quantum mechanics has proven to be successful. Even on the macroscopic scale, the development of chaos theory upset the deterministic aspect of Newton's clockwork universe. Additionally, the microstructure of matter has been probed down to the scale of quarks and leptons. The extent of the visible universe has been measured, revealing a hot, explosive beginning 13.7 billion years ago. Ideas are coming at a much faster pace. Dark matter, dark energy, inflationary theory and the Higgs mechanism of mass generation, all considered imaginative speculations of the 20th century, are now part of established science in light of convincing observational data. Concepts such as string theory, higher dimensions, and the multiverse are now being explored. We find that many properties of the universe appear to be fine-tuned for our existence to be possible. It seems our scientific knowledge is expanding much faster than our considerations of how it all relates to faith.

Several modern physicists-astronomers have chosen to divert their efforts from science to exploring a meaningful fit between science and faith. John Polkinghorne, Ian Barbour, Gerald Schroeder, and Hugh Ross are a few examples of physicists who have written influential books on the positive fit between them, all with unique perspectives.³⁵ These scientists find it unnecessary to pit themselves against the scientific majority, accepting the explanatory power of science as common ground with unbelieving scientists. It appears that rather than using science to prove God, a favorite approach of natural theology, it is much more persuasive to argue that the universe is very consistent with a purposeful, Creator God and that its beauty and elegance draws us to seek God. While the new developments in physics continue to stir lively discussion and thoughts on how these relate to Christian faith, often the connections return to the same themes of the early scientists. We continue to see that the "learned times" we are in have not removed the role of religious faith. Contrary to Steven Weinberg's assertions, our need for God is not being eliminated by the explanatory power of science.

In many ways it appears that believing scientists today are rediscovering the perspectives of the early scientists and finding once again a positive relationship between science and faith. Of course, today we have same yearnings as they did to discover truth from the world we live in. It is evidently a part of our human nature. As beings "created in the image of God", as stated in Genesis 1:27, our yearning to understand the world can be accepted as a God-like aspect of our nature. If we are interested in the truth, we do not need to fear what nature will reveal to us. Some interpretations of Scripture will not survive the testimony of nature, but since God is the author of all truth, it should nonetheless be a welcome revelation to us. Rather than choosing to live in the realm of ideas like the ancient Greeks, we can choose to pursue how the universe really works and understand how God designed it. These insights can only enhance our view of the living God and how He has chosen to reveal Himself in the book of nature, just as we accept that He has revealed Himself to us in the book of God's Word.

³⁵ Examples of these authors' writings include the following: John Polkinghorne, "Exploring Reality: the Intertwining of Science and Religion", Yale University Press, 2005, Ian Barbour, "Issues in Science and Religion", Prentice-Hall, 1966, Gerald L. Schroeder, "The Science of God: the Convergence of Scientific and Biblical Wisdom", Broadway Books, 1997, Hugh Ross, "More than a Theory: Revealing a Testable Model for Creation", Baker Books, 2009.