

Science and Christianity in the Modern Age: An Exposition and Critique of Ian G.
Barbour's "Ways of Relating Science and Religion"

By

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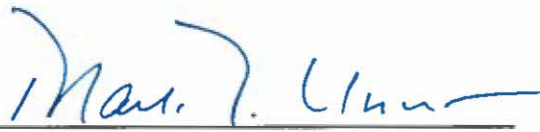
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Title: SCIENCE AND CHRISTIANITY IN THE MODERN AGE: AN EXPOSITION AND CRITIQUE OF IAN G. BARBOUR'S "WAYS OF RELATING SCIENCE AND RELIGION"

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Professor Mark Unno

This work attempts to understand the relationship between the scientific enterprise and the religion of Christianity in light of Ian G. Barbour's notable work on the topic in his 1997 book *Religion and Science: Historical and Contemporary Issues*. Specifically, this work attempts to provide a current and fresh perspective on Barbour's four possible approaches to the relationship between science and Christianity: (1) Conflict, (2) Independence, (3) Dialogue, and (4) Integration. While Barbour believes the answer to reconciling science and Christianity lies in the *Integration* category, we will show in the course of this work that science and Christianity are actually caught in conflict, and they may not be integrated into a single worldview as Barbour contends.

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I. Introduction

In this day and age, many of us find ourselves in a predicament. On the one hand, religion has been an integral part of our lives for thousands of years. It is by these religions that we understand why we are here, what we are supposed to do, and what is going to happen to us when we die. But, on the other hand, modern science, with all its life-changing technologies, puts forth an understanding of our existence that varies from the religions of old. So what are we to make of this variation today? Are science and religion independent enterprises, unrelated to each other? Are they in a struggle to the death? Or are we able to understand our metaphysical situation only by a combination of scientific knowledge and Christian doctrine?

Let's consider how this disagreement manifests itself in our daily lives, first through politics, then through warfare. By the system of democracy, everyone is given a voice. We have the freedom to express our opinions with our vote by which we elect representatives and determine legislation. People have different beliefs and opinions, however, and these differences are played out in our elections. Many people approach controversial topics like gay marriage, stem-cell research, abortion rights, and even climate change in terms of their personal beliefs. By giving everyone a voice, democracy effectively gives people a way to impose their beliefs on others. Take for example a fundamentalist Christian who lives their life according to a literal interpretation of the Bible. This Christian might oppose abortion or gay marriage rights based on their religious beliefs. Is it right that the life of a young pregnant woman, or the life of a gay person should be decided by complete strangers? Similarly, modern warfare gives people the ability to impose their beliefs on others in violent and often

deadly ways. The quintessential example is the World Trade Center attacks of 2001 when fundamentalist Muslims killed some three thousand people by hijacking airplanes and flying them into high-rise office buildings in New York City. Another horrific example is the bombing of abortion clinics, and the murder of abortion clinic employees by fundamentalist Christians in America in recent decades. It is one thing for people to hold different beliefs, but it is another thing entirely for people to force their beliefs on others by the penalty of death. It follows that one of the most pertinent questions of the time is how do we reconcile science and religion?

This question is not new by any means. Ever since the birth of modern science with Copernicus' heliocentric model of the solar system in the sixteenth century, many of humanity's greatest minds have pondered this very question. Today, nearly five hundred years later, this question is more relevant than ever as people's lives literally hang in the balance. Perhaps the best-known modern scholar on the relationship between science and religion is Ian G. Barbour. His 1966 book *Issues in Science and Religion* "has been credited with literally creating the contemporary field of science and religion."¹ In 1997, Barbour published *Religion and Science: Historical and Contemporary Issues* which helped win him the 1999 Templeton Prize honoring "a living person who has made an exceptional contribution to affirming life's spiritual dimension, whether through insight, discovery, or practical works."² John Cobb, in his recommendation of Barbour for the Templeton Prize, wrote, "No contemporary has made a more original, deep and lasting contribution toward the needed integration of

¹ PBS Online Newshour, profile of Ian Graeme Barbour, published May, 28, 1999, accessed December 30, 2013 <<http://archive.is/NESg>> saved on September 12, 2012 from <http://www.pbs.org/newshour/forum/june99/barbour_bio.html>

² The Templeton Prize, a signature program of the John Templeton Foundation, accessed December 30, 2013 <<http://www.templeton.org/signature-programs/templeton-prize>>

scientific and religious knowledge and values than Ian G. Barbour. With respect to the breadth of topics and fields brought into this integration, Barbour has no equal.”³

The purpose of this work is to provide a fresh and current perspective on Barbour’s influential work. Specifically, this work focuses on chapter four of Barbour’s book *Religion and Science* titled “Ways of Relating Science and Religion.” In this chapter, Barbour delineates four categories of thought pertaining to the relationship between science and religion: (1) Conflict, (2) Independence, (3) Dialogue, and (4) Integration. The approaches of the *Conflict* category find only struggle between science and religion. Those of the *Independence* category negate this struggle by separating science and religion to distinct spheres of human experience. The approaches of the *Dialogue* category find similarities between science and religion that bring the two together in constructive conversation. Finally, the approaches of the *Integration* category draw from both science and religion to create a coherent and comprehensive metaphysical scheme. Other authors have used similar categories of thought to understand the relationship between science and religion. For example, John Haught, in his 1995 book *Science and Religion: From Conflict to Conversation*, uses the same four categories but uses different labels. Instead of *Conflict*, *Independence*, *Dialogue*, and *Integration*, Haught uses *Conflict*, *Contrast*, *Contact*, and *Confirmation*.⁴

While Barbour describes the relationship between science and all the religions of the world, this work is refined only to the relationship between science and Christianity. This refinement is motivated by four considerations. First, the limitations

³ Current News of the Templeton Foundation, “Templeton Prize Laureate Ian Barbour, pioneer in science and religion, dies at 90,” accessed January 28, 2014 <http://www.templetonprize.org/news_barbour.html>

⁴ John Haught, *Science and Religion: From Conflict to Conversation* (Mahwah, NJ: Paulist Press, 1995), p. 9.

of this project simply do not allow such a broad consideration of the world's religions in relation to science. Second, modern science was developed in a predominately Christian milieu, that is to say, science and Christianity have a unique relationship because what we know today as "modern science" began in Western Europe at a time when nearly everyone was a devout Christian. Third, according to surveys conducted by Pew Research Center, 73% of Americans identify as Christians, and there are 2.2 billion Christians worldwide.⁵ Needless to say, the relationship between science and Christianity is of utmost relevance today. Fourth, while Barbour tries to encompass all the world's religions in his analysis, the majority of his attention lands on the Christian tradition, and Barbour was a Christian himself. All considerations aside, examining the relationship between science and Christianity provides only a one-dimensional view of the larger relationship between science and all the religions of the world. Perhaps this refinement does not do justice to the nature of this larger relationship, but Christianity is the most popular religion in the world, it has the longest tradition of grappling with scientific findings, and there are certainly useful parallels to be drawn between Christianity and the other religions of the world with respect to science. In brief, Christianity is a good place to start.

This work aims to expand on Barbour's original analysis of science and religion by understanding his categories of thought through new authors and ideas, as well as by introducing new worldviews like the "New Atheist Movement," Stephen Jay Gould's "non-overlapping magisteria," and a discussion of the religiosity of science.

⁵ PewResearch: Religion and Public Life Project, "Nones' on the Rise," published October 9, 2012, accessed January 27, 2014, <<http://www.pewforum.org/2012/10/09/nones-on-the-rise/>> and "The Global Religious Landscape," published December 18, 2012, accessed January 27, 2014, <<http://www.pewforum.org/2012/12/18/global-religious-landscape-exec/>>

Furthermore, we will critique Barbour's personal views according to the framework expounded here, and then draw new conclusions regarding the relationship between science and Christianity. Whereas Barbour believes the answer to reconciling science and Christianity lies in the *Integration* category with a combination of "Theology of Nature" and process thought, we will find that Barbour's position is biased towards Christianity, and science and Christianity are actually caught in conflict.

II. Conflict

Perhaps the most popular conception of the relationship between science and Christianity is one of conflict. Throughout history, science has built a story of reality that differs, at least literally, from the story of reality found in the Bible. Barbour distinguishes between *scientific materialism* and *biblical literalism* which occupy opposite extremes on a diverse ideological spectrum. For adherents of both these worldviews, science and Christianity cannot coexist, and eventually the true descriptor of reality will prevail, the imposter left to fade into history. First, we will examine with brevity some of the key historical moments which spawned modern science and began it on a collision course with Christianity. We will discuss scientific materialism and the general worldview of science, then turn our attention to *creationism* and the worldview of the Bible. We will also consider the origins and basic doctrine of *atheism* as it falls closely in line with scientific materialism and lies in clear opposition to biblical literalism.

The "Ciudad de las Ideas" debate on religion in 2009 offers a perfect illustration of the struggle and competition that has come to represent the relationship between not

just science and Christianity, but science and religion in general. The pro-religion group consisted of Jewish advocate Rabbi Shmuley Boteach, conservative political commentator and author Dinesh D'Souza, and Lebanese statistician Nassim Nicholas Taleb. The anti-religion group consisted of British author and political commentator Christopher Hitchens, American author and neuroscientist Sam Harris, and American philosopher and cognitive scientist Daniel Dennett. These polarizing figures were gathered together to debate religious, theological, and scientific topics, and they did so on a stage with a microphone perched amid a miniature boxing ring with boxing gloves dangling over the ropes. This event and setting certainly suggest that science and religion are fundamentally at odds, and they may not be able to coexist.

The scientific worldview has a long and interesting history. While the foundations of logic date back to the ancient Greek mathematicians and philosophers, the true roots of “modern science” date back to the sixteenth century. Once Copernicus posited that the sun, not the earth, was the center of the solar system, the puzzle pieces of science began falling into place. Barbour refers to those who believe science possesses the truth about life and the universe as *scientific materialists*. They believe “the scientific method is the only reliable path to knowledge,” and that “matter (or matter and energy) is the fundamental reality in the universe.”⁶ In addition to these beliefs, many scientific materialists believe the scientific narrative undermines the Christian tradition and exposes it as a myth. We find examples of this ideological position in the writings of many of science’s biggest players both past and present.

⁶ Ian Barbour, *Religion and Science: Historical and Contemporary Issues* (San Francisco, CA: HarperCollins, 1997), p. 78.

When it comes to the idea of conflict between science and Christianity, the classic example is the trial of Galileo by the Catholic Church in the seventeenth century. But before we get to this confrontation, let us briefly explore and appreciate Galileo's contributions to the scientific enterprise. Galileo used a telescope to look deeper into the night sky than any human before him. In his *Sidereus Nuncius*, which he published in 1610, Galileo describes the presence of Jupiter's moons, the pattern of the phases of Venus, the presence of mountains and valleys on the surface of the Moon, and the presence of stars invisible to the naked eye. Not only did Galileo's discoveries prove that there was much humans did not understand about the cosmos, the idea of objects orbiting things other than the earth lent support to Copernicus' heliocentric model of the solar system. Galileo would be prosecuted for his advocacy of heliocentrism, but he made other notable contributions to science. He was among the first to understand acceleration, uniform motion, and friction by his masterful use of experimentation, mathematical description, and imagination. While Aristotle had emphasized the teleological aspect of an event, or why the event occurred, Galileo focused on how the event actually unfolded, and in so doing laid the foundations of modern science.

The evidence of a heliocentric solar system that Galileo saw through his telescope landed him in hot water with the Roman Catholic Church. Heliocentrism contradicts the literal word of several Bible verses, like Psalms 93:1 and 1 Chronicles 16:30 which state, "The world is firmly established; it cannot be moved," as well as Psalm 104:5, "He set the earth on its foundations; it can never be moved," and Ecclesiastes 1:5, "The sun rises and the sun sets, and hurries back to where it rises."⁷

⁷ Verses from *Holy Bible: New International Version*, (Grand Rapids, MI: Zondervan, 2005).

Ultimately, Galileo was found guilty of heresy and sentenced to house arrest, where he eventually died. Meanwhile, the Roman Catholic Church denounced his writings with vigor. Unfortunately, this image of strife still looms over science and Christianity today. It is as if the fates of both these ideologies were decided in this historic confrontation.

For the sake of chronology, we move from Galileo in the seventeenth century, to the French *philosophes* of the eighteenth century to shine a light on the beginnings of the atheist movement which is now growing more rapidly than ever before. Today, most people who subscribe to the view of scientific materialism also subscribe to atheism as many believe the former implies the latter. The idea of atheism has existed for millennia, but the movement gained serious momentum in the eighteenth century with the philosophes, who were the intellectual heirs of the Enlightenment begun by Descartes, Newton, and so many others. Frenchman Baron d’Holbach was a philosophe, a materialist, and an atheist. His *Christianity Unveiled*, published in 1766, highlighted many of the inconsistencies within the religion, and his *The System of Nature*, published in 1770, expounded the laws of nature and emphasized the power of religion to corrupt by ignorance. Voltaire, also a philosophe, referred to the latter as the “Bible of Atheism.”

Voltaire made many contributions of his own to the atheist movement. We find an illustration of Voltaire’s attitude towards religious ideals in the following quote from a poem he wrote about the Lisbon earthquake of 1755. The earthquake killed tens of thousands of people, most of whom were Christians worshipping in church as the disaster occurred around ten o’clock in the morning on the holiday of All Saint’s Day. Voltaire reflects on the religious insecurity aroused by the earthquake:

But how conceive a God supremely good,
Who heaps his favours on the sons he loves,
Yet scatters evil with as large a hand?
What eye can pierce the depth of his designs?
From that all-perfect Being came not ill:
Yet it exists. O stern and numbing truth!
O wondrous mingling of diversities!
A God came down to lift our stricken race:
He visited the earth, and changed it not!
One sophist says he had not power to change;
“He had,” another cries, “but willed it not:
In time he will, no doubt.” And, while they prate,
The hidden thunders, belched from underground,
Fling wide the ruins of a hundred towns
Across the smiling face of Portugal.
God either smites the inborn guilt of man,
Or, arbitrary lord of space and time,
Devoid alike of pity and of wrath,
Pursues the cold designs he has conceived.⁸

In this passage, Voltaire mocks the notion that God is omnipotent and constantly intervening. Instead, he suggests that God is only the detached God of deism, an initial designer with no conception of, or concern for good and evil. Voltaire was an outspoken advocate of religious freedom and the separation of church and state, but he had his objections to religion as well.

The polarizing findings of Charles Darwin in the nineteenth century marks another prominent moment in the history of both scientific and Christian thought. In his *On the Origin of Species*, published in 1859, Charles Darwin describes his theory of biological evolution by random variation and natural selection. This theory is a major pillar of the scientific worldview for it describes how complex life like human beings can evolve from primitive microbial life-forms. Darwin’s path was paved in part by the ideas of Jean Baptiste Lamarck and Charles Lyell. In his *Zoological Philosophy*,

⁸ *Toleration and Other Essays by Voltaire*, translation and introduction by Joseph McCabe (New York: G. P. Putnam’s Sons, 1912), p. 259-260.

Lamarck posits that the form of animals is subject to change depending on environmental constraints. Lyell, one of the first proponents of *uniformitarianism*, believed the same laws and processes governing nature today had been shaping nature since the remote past. These ideas would become integral to Darwin's conception of evolution.

According to the theory of evolution, all life on earth is descended from microbial life-forms that existed about 3.5 billion years ago. Being randomly physically different from one another (a difference now attributed to DNA), the offspring of these microbial life forms possessed different sets of physical attributes with which to survive. Physical attributes that allow certain creatures to survive and procreate more effectively than others are passed along from generation to generation by virtue of their promoting survival and procreation; Darwin called this process "natural selection." A "species" occupies a "niche" in nature in that it possess a set of physical attributes uniquely well-suited for surviving and procreating in a specific environment. According to evolutionary theory, the entire animal kingdom is related, including human beings.

But this story of life, i.e. the Darwinian story of evolution by natural selection, is not the story of life told in the book of Genesis, and scientific materialists and biblical literalists line up on opposite sides of this discrepancy. The theory of evolution requires nearly unfathomable time scales of millions and billions of years, but a literal interpretation of Genesis indicates the earth is only about six thousand years old (Christians who accept this age of the earth are known as *young-earth creationists*). Furthermore, the theory of evolution does not agree with the creation of man in the image of God (Genesis 1:27), or the creation of woman from a man's rib (Genesis

2:23). In fact, according to the theory of evolution, the image of human beings is based on nothing but the set of physical attributes that best allowed us to survive in our niche. Evolution quickly became a point of division between scientific materialism and biblical literalism, and it remains a point of division to this day.

As we will see in the following sections, many people have found ways to reconcile evolution with Christian doctrine, but Darwin was not one of them. It is worth our while to quote directly from Darwin's autobiography to portray accurately his personal theological and metaphysical views as the matter is frequently misunderstood and misquoted in our time. In Darwin's own words:

A source of conviction in the existence of God ... follows from the extreme difficulty or rather impossibility of conceiving this immense and wonderful universe, including man and his capacity for looking backwards and far into the futurity, as the result of blind chance or necessity. When thus reflecting I feel compelled to look to a First Cause having an intelligent mind in some degree analogous to that of man; and I deserve to be called a Theist. This conclusion was strong in my mind ... when I wrote the *Origin of Species*, and it is since that time that it has very gradually, with many fluctuations become weaker... The mystery of all beginnings of all things is insoluble by us; and I for one must be content to remain an Agnostic.⁹

The scientific enterprise, for Darwin, presented overwhelming evidence against theism, but he did go so far as to declare himself an atheist. Darwin believed human beings would never possess an explanation of all things, although his theory of evolution would become one of the most important contributions toward such an explanation. Evolutionary theory continues to be a polarizing topic within the modern controversy between science and Christianity.

⁹ Charles Darwin, *The Autobiography of Charles Darwin*, with original omissions restored, edited with appendix and notes by his grand-daughter Nora Barlow (New York, NY: W.W. Norton & Company Inc., 1969), p. 92-94.

Evolution was not the only nineteenth-century discovery to bear on the scientific enterprise. The rise of *biblical scholarship* in Germany suggested the Bible was written by humans, not by God. These findings led some people to view the story of the Bible as a myth in the same sense that the *Odyssey* or *Beowulf* are considered myths, but others came to view the Bible as a human record of God's revelations to mankind. Sigmund Freud, the famous psychoanalyst, believed religion was indeed a human creation. He believed human history indicated a trend away from religion and toward science:

At the animistic stage men ascribe omnipotence to *themselves*. At the religious stage they transfer it to the gods but do not seriously abandon it themselves, for they reserve the power of influencing the gods in a variety of ways according to their wishes. The scientific view of the universe no longer affords any room for human omnipotence; men have acknowledged their smallness and submitted resignedly to death and to other necessities of nature.¹⁰

In this passage, Freud defines "religion" and "gods" as human conceptions, and considers them obsolete in the wake of the scientific worldview. This passage also demonstrates an important relationship between science and our opinion of ourselves, in that the greater the scope of scientific knowledge, the more insignificant human life can seem in comparison. This notion is unsettling for many, but it is one that appears necessarily in materialist philosophy.

Unprecedented discoveries in particle physics and astrophysics during the early-twentieth century made people question the role of humanity in the universe even more than after the emergence of Darwinism and biblical scholarship in the nineteenth century. In 1929, only decades removed from Einstein's articulations of special

¹⁰ Sigmund Freud, *Totem and Taboo* (New York, NY: W. W. Norton and Co., 1913), p. 88.

relativity, general relativity, and quantum physics, Edwin Hubble used the largest telescope of the time to show that the universe was indeed expanding. If the universe is expanding, then common sense tells us it was smaller in the past. Go back in time far enough and the entire universe must have been crammed into one tiny point of nearly-infinite heat and density before it exploded in a “Big Bang” giving rise to the universe we find ourselves in today. In 1964, science stumbled upon hard evidence for this theory when two radio astronomers in New Jersey measured a background radiation of the universe of approximately 3°K .¹¹ This “cosmic microwave background radiation,” or “CMB,” is the radiation that was released when electrons and protons combined to form the first hydrogen atoms when the universe was still less than 400,000 years old. Before this recombination, the universe was a hot plasma soup that trapped all radiation, but after the recombination, photons had space to move freely about the universe. The CMB we see today is these photons still zooming around the universe.¹² Scientists have spent the last half-century, since the discovery of the CMB, trying to understand the conditions of the early universe. Of particular interest today is the unification of the four physical forces – the electromagnetic force, the weak force, the strong force, and the force of gravity. These forces must have been part of the singularity that exploded in the Big Bang, therefore, a single mathematical expression describing all four forces may be possible.

The scientific community continues to work toward a complete unification of the four physical forces in a “theory of everything,” or “T.O.E.” American physicist

¹¹ R. H. Dicke, P. J. E. Peebles, P. G. Roll, and D. T. Wilkinson, “Cosmic Black-Body Radiation” *Journal of Astrophysics*, **142**, 414 (1965).

¹² Steven Weinberg, *The First Three Minutes: A Modern View of the Origin of the Universe* (New York, NY: Basic Books, 1988, afterword published 1993), see Chapter 4 “Recipe for a Hot Universe.”

Steven Weinberg won the Nobel Prize in physics in 1979 for his unification of electromagnetism and the weak force. It is natural to mention Weinberg here in the *Conflict* category for his contributions to scientific knowledge, as well as for his personal views on the consequences of scientific materialism. In the first edition of his book, *The First Three Minutes*, published in 1976, Weinberg writes, “the more the universe seems comprehensible, the more it also seems pointless.”¹³ Fifteen years later he would qualify this statement in writing, “I did not mean that science teaches us that the universe is pointless, but rather that the universe itself suggests no point.”¹⁴ But what does it mean for the universe to be pointless? Reminiscent of Freud’s idea that science has exposed and affirmed mankind’s smallness, a pointless universe implies that every particle of matter in the universe is equal in its quest for existence, be that particle in a star, a human, an animal, a tree, a rock, an atom, or a neutrino. Weinberg writes, “... I would guess that, though we shall find beauty in the final laws of nature, we will find no special status for life or intelligence. A fortiori, we will find no standards of value or morality. And so we will find no hint of any God who cares about such things.”¹⁵ While the idea of a pointless universe may cause discomfort for some, Weinberg respects and embraces this idea as a natural byproduct of the metaphysics of science.

Today, the scientific enterprise pushes onward. Larger particle accelerators like the Large Hadron Collider at CERN in Geneva, Switzerland allow scientists to look deeper and deeper into the nature of elementary particles and the physical forces that

¹³ Ibid., 154.

¹⁴ Steven Weinberg, *Dreams of a Final Theory: The Scientist’s Search for the Ultimate Laws of Nature* (New York, NY: Vintage Books: A Division of Random House, Inc., 1994), p. 255.

¹⁵ Ibid., 250.

govern their behavior. Recently, in July of 2012, the discovery of the Higgs boson, or as many have called it, the “God Particle,” provided a critical piece to the scientific puzzle by shedding light on the fundamental nature of mass. It appears that mass is only a result of particles interacting with the Higgs field. This discovery is a testament to the work left to be done in the scientific enterprise. While we have learned much about ourselves and the universe from science, there is much we do not fully understand. Every day scientists work to expand upon the general knowledge of science in the hope that science will one day possess a complete story of the cosmos, from the Big Bang to human beings.

In this day and age, however, there are a number of factors that impede the progress of science. Economics, ethics, politics, and religion are but some of these factors. Today, some people find themselves in the business of clearing a path for science amidst these modern pressures. Christopher Hitchens, Richard Dawkins, Daniel Dennett, and Sam Harris, otherwise known as the “four horsemen,” are the modern champions of scientific materialism, atheism, and secularism. They perpetuate the image of conflict between science and Christianity by upholding the former and condemning the latter. Beyond writing books and articles, these distinguished scholars often engage theologians and religious individuals in public debate. Many people consider the four horsemen the “high priests of science.”

The first of the four horsemen is British-American author, political activist, and journalist, Christopher Hitchens. Hitchens was an adamant proponent of science and opponent of religion. He preferred the term “antitheist” over “atheist” in reference to himself, he writes, “I not only maintain that all religions are versions of the same

untruth, but I hold that the influence of churches and the effect of religious belief, is positively harmful.”¹⁶ This contempt for religion stemmed from his “distrust” of “anything that contradicts science or outrages reason.”¹⁷ Although he was not himself a scientist, Hitchens upheld the scientific worldview and favored its doctrine over that of religion; “As in all cases, the findings of science are far more awe-inspiring than the rantings of the godly.”¹⁸ Those who stood in opposition of Hitchens, frequently rebuked his harsh language and condescending tone, but such is often the criticism against those who speak freely against religion. Perhaps it is just Hitchens’ brand of bravery and audacity as an author and orator that is needed to remove the taboo of discussing and sometimes criticizing religion in the public view.

The second of the four horsemen is the British evolutionary biologist, Richard Dawkins. Dawkins is one of the most popular, if not the most popular, champions of science alive today. He is known by theists and atheists alike, receiving praise and contempt from both sides. Much of Dawkins’ work as a scientist was focused on the genetic foundations of the various mechanisms of natural selection, particularly the genes associated with altruism. In his book *The Blind Watchmaker*, Dawkins explains how Darwin’s theory of evolution refutes the idea of even a deistic intelligent designer, much less a theistic, personal, and interventionist designer. In a 1995 interview with Kam Patel of the United Kingdom’s magazine *Times Higher Education*, Dawkins said, “Certainly I see the scientific view of the world as incompatible with religion ... What

¹⁶ Christopher Hitchens, *Letter to a Young Contrarian* (New York, NY: Basic Books, 2001), p. 55.

¹⁷ Christopher Hitchens, *God is not Great: How Religion Poisons Everything* (New York, NY: Hachette Book Group, 2007), p. 5.

¹⁸ *Ibid.*, 57.

is interesting about the scientific world view is that it is true, inspiring, remarkable and that it unites a whole lot of phenomena under a single heading.”¹⁹

It should come as no surprise then that Dawkins does not believe in God. In his book *The God Delusion*, Dawkins poses a theoretical spectrum of belief in God on a scale from 1 to 7, where 1 is “Strong theist. 100% probability of God,” and 7 is “Strong atheist,” “I know there is no God.”²⁰ In the book, Dawkins identifies himself as a 6, “Very low probability, but short of zero [that God exists]. *De facto* atheist.” Many scientists are hesitant to discard as impossible that for which they have no evidence because if presented with compelling evidence the good scientist is the first to adjust his understanding. But, in fact, Dawkins is so confident that he will encounter no such evidence that in a discussion with then-Archbishop of Canterbury Dr. Rowan Williams in 2012, Dawkins classified himself rather as a 6.9.

There is no doubt of Dawkins’ stance amongst the scientific materialists, but Barbour argues that Dawkins over-extends the domain of science into philosophical and religious domains. The fact of the matter is that although science does not currently possess a complete story of nature, everything in nature is made of matter and energy in such a way that physics and chemistry seek to describe. It requires only a small step of deduction to imagine a scenario in which science can explain everything in nature, including consciousness, love, and other experiences typically reserved to the religious realm. It follows that one day the pursuits of philosophy, religion, and even science itself may have scientific explanations, i.e. physical and chemical explanations. By this

¹⁹ Quote from Richard Dawkins’ interview with Kam Patel, “Going the whole hog” (Times Supplements Ltd, 1995).

²⁰ Richard Dawkins, *The God Delusion* (New York, NY: A Mariner Book of Houghton Mifflin Company, 2008), p. 50 – 51.

thinking, Dawkins is not over-extending the reach of science as Barbour contends.

There may be more truths within the worldview of scientific materialism than Barbour would like to admit, but, in the end, the final judge will be time.

Daniel Dennett, the third horseman, is an American philosopher, cognitive scientist, atheist and secularist. He upholds neo-Darwinism (the combination of Darwinian evolution and Mendelian genetics), and argues that those who reject the theory of biological evolution are “inexcusably ignorant.”²¹ When trying to understand the nature of consciousness, Dennett believes that in order to overcome the pitfalls of dualism, which have plagued philosophy for so long, we must turn to the tool box of the scientific materialist who believes that “we can (in principle!) account for every mental phenomenon using the same physical principles, laws, and raw materials that suffice to explain radioactivity, continental drift, photosynthesis, reproduction, nutrition, and growth.”²² For Dennett, the human mind is a naturally evolved organ from which religion emanates, an idea that he elucidates in his 2006 book *Breaking the Spell: Religion as a Natural Phenomenon*. The conflict between science and religion is very real to Dennett, “I think that there are no forces on this planet more dangerous to us all than the fanaticisms of fundamentalism, of all the species: Protestantism, Catholicism, Judaism, Islam, Hinduism, and Buddhism, as well as countless smaller infections. Is there conflict between science and religion here? There most certainly is.”²³

Sam Harris is an American philosopher and neuroscientist and the youngest of the four horsemen. His 2004 book *The End of Faith* was motivated in part by the

²¹ Daniel Dennett, *Darwin's Dangerous Idea: Evolution and the Meaning of Life* (New York, NY: Touchstone, 1995), p. 46.

²² Daniel Dennett, *Consciousness Explained* (Boston, MA: Little, Brown and Co., 1991), p. 33.

²³ Dennett, *Darwin's Dangerous Idea*, 515.

horrific World Trade Center attacks of 2001 and became a *New York Times* best seller. In this book, Harris argues that religious belief is inherently unreasonable and is therefore a regressive force. In particular, Harris points to the dangers of modern “religious moderates” whose “terrible dogma” of “religious tolerance ... is one of the principal forces driving us towards the abyss.”²⁴ Harris, like Dennett, believes the scientific enterprise will one day have scientific explanations for the human psyche, morality, and emotions, and when this day comes the traditions and practices of the world’s religions will most likely become obsolete. On this topic, Harris writes:

If we better understood the workings of the human brain, we would undoubtedly discover lawful connections between our states of consciousness, our modes of conduct, and the various ways we use our attention. What makes one person happier than another? Why is love more conducive to happiness than hate? Why do we generally prefer beauty to ugliness and order to chaos? Why does it feel so good to smile and laugh, and why do these shared experiences generally bring people closer together? Is the ego an illusion, and, if so, what implications does this have for human life? Is there life after death? These are ultimately questions for a mature science of the mind. If we ever develop such a science, most of our religious texts will be no more useful to mystics than they now are to astronomers.²⁵

Perhaps Harris is simply ahead of his time with his optimistic view of the future scope of scientific knowledge, but, again, only time will tell.

The “New Atheist Movement,” of which the four horsemen are definitely part, is a growing movement around the world. According to Gallup polls, the percentage of Americans who have no religious preference has increased from 2% in 1963 to 15% in 2013, and the percentage of people who do not believe in God has increased from 1% in

²⁴ Sam Harris, *The End of Faith: Religion, Terror, and the Future of Reason* (New York, NY: W. W. Norton and Co., 2004), p. 14-15.

²⁵ Harris, *The End of Faith*, 20.

1967 to 11% in 2013.²⁶ Groups like the “American Atheists”, the “Atheist Foundation of Australia,” and “Atheist Alliance International” continue to spread awareness for atheism and secularism today. Many scientific materialists believe science and atheism go hand-in-hand. They believe scientific knowledge does not support the existence of unverifiable miracles or invisible, supernatural entities, like gods, angels, demons, and ghosts. But scientific materialism is just one philosophy stemming from the scientific enterprise, not all of which are so cold towards religious notions.

On the opposite end of the ideological spectrum from scientific materialism is *biblical literalism*, to use Barbour’s terminology, which is the second worldview of this *Conflict* category. While the former upholds the truth of the scientific narrative, the latter upholds the truth of the literal word of the Bible. In the U.S., there are literalist groups affiliated with nearly every Christian denomination, such as the fundamentalist Mormons, the Amish, and a large fraction of Southern Baptists, and Evangelical Christians. While more liberal Christians find ways of reconciling biblical doctrine and scientific knowledge, for the strict Christians of this category, the scientific enterprise poses a threat to their millennia-old worldview.

The evolution of the biblical worldview throughout history has been influenced in large part by the historical trajectory of science. The progress of science rarely goes unchecked by clergymen, theologians, or the common Christian who face the same metaphysical challenge we all face; deciding upon the best course of action for leading effective and fulfilled lives, in light of both scientific and religious teaching. We saw the confrontation between Galileo and the Roman Catholic Church when Galileo’s

²⁶ Gallup.com, Religion, <<http://www.gallup.com/poll/1690/Religion.aspx>>

affirmation of the heliocentric model of the solar system contradicted several verses of the Bible. In the mid-nineteenth century, Darwin's theory of evolution met aggressive opposition from those in favor of the story of man's origins found in Genesis. The theory of the Big Bang beginning of our universe added a new dimension to the controversy, albeit one that has been reconciled with biblical doctrine in a variety of ways which we will see in upcoming sections. Today, according to a 2011 Gallup poll, 30% of Americans view the Bible as the actual word of God and believe the stories therein are true accounts of history.²⁷

Much of the tension between scientific materialism and biblical literalism stems from the theory of evolution. Evolution simply does not agree with a literal interpretation of the Bible. The Christian must either reject evolution or adapt Christian doctrine to include evolution. Charles Hodge, who was head of the "Princeton Theological Seminary" for fifty years, the largest Presbyterian seminary in the U.S., made the choice to reject evolution. In 1872, Hodge published a multi-volume set entitled *Systematic Theology* in which he goes to impressive lengths to detail the arguments for and against the existence of God from inside and outside the Christian tradition. Hodge affirmed the physical laws of nature coming down from Copernicus and Newton as true descriptions of the universe, but he dismissed the materialism of science arguing that it contradicts the "facts of consciousness," the "truths of reason," and is "inconsistent with the facts of experience."²⁸ In *What is Darwinism?*, published in 1874, Hodge opposes the theory of evolution because, to him, it points away from an

²⁷ Jeffery M. Jones, "In U.S., 3 in 10 Say They Take the Bible Literally," Gallup, published July 8, 2011, accessed January 6, 2014, <http://www.gallup.com/poll/148427/say-bible-literally.aspx>

²⁸ Charles Hodge, *Systematic Theology: Volume 1* (New York, NY: Scribner, Armstrong, and Co., 1873), p. 278, 280, and 282.

intelligent designer. This inspired his ultimate conclusion, “What is Darwinism? It is atheism.”²⁹ For Hodge, all the answers to life’s mysteries could be found in the Bible, the bedrock of the Christian faith which “satisfies the reason, the heart, and the conscience.”³⁰

Eventually, the controversy between science and Christianity was thrust into the national spotlight when it spilled into the classroom. John Scopes was put on trial in 1925 for teaching evolution in his science class, a violation of Tennessee’s Butler Act which prohibited the teaching of evolution or any scientific idea that denied the biblical account of human origins. Scope’s was convicted for breaking Tennessee law, but the constitutionality of the law was never tried. Anti-evolution laws in Tennessee, Arkansas, and Mississippi kept evolution out of the classroom until the 1960’s.

Today, we use the term *creationism* to describe the view that Genesis recounts the factual creation of the universe by God. Most creationists endorse *creation science*, or the idea that the Bible is true in a scientific sense. In other words, for creationists, the Bible is historically true and there is scientific evidence to support this claim. Creationists maintain that the secular enterprise of science is more ambiguous, fragile, and uncertain than it appears in the media and in the classroom. There are *young-earth creationists*, who uphold the literal account of creation according to the Bible, and *old-earth creationists*, who interpret the Bible more leniently which creates room for scientific knowledge in Christian doctrine. The beliefs of the former are more characteristic of the *Conflict* category as there is practically no agreement between young-earth creationism and scientific materialism. For the young-earth creationist,

²⁹ Charles Hodge, *What is Darwinism?* (New York, NY: Scribner, Armstrong, and Co., 1874), p. 177.

³⁰ Hodge, *Systematic Theology: Volume 1*, 276.

God is the Creator of life and the universe, and he did it in six days. The earth is around 6,000 years old, Adam and Eve are the ancestors of every human on earth, and Noah survived a flood and preserved the human race by building an ark.

For some examples of young-earth creationist thinking, let us turn to Canadian geologist and Seventh-day Adventist George McCready Price. Price endeavored to reorient the Christian church amid what he saw as many conflicting claims put forth in the name of modern science. On the subject of the origin of matter, Price writes, “...we still do not know how matter ever could have originated, except that ‘in the beginning’ it was called into existence by the fiat of Him whom we Christians worship as our God, the Creator.”³¹ Perhaps not surprisingly, Price follows a similar line of thinking for the origin of energy, arguing that the law of conservation of energy “is strong evidence that there must have been a real Creation at some time in the long ago.”³² As for Darwinian evolution, by Price’s measure, it is no more than a “theory of satanic origin.” The long periods of geological time required for evolution to occur “are simply *the devil’s counterfeit of the six days of creation.*”³³ In fact, for Price, evolution is not a process of crescendo where higher life forms evolve from lower life forms, but it is one of decrescendo as “degeneration has marked the history of every living form.”³⁴ But Price takes issue not only with the evolutionists who flaunt their facts of science about, he also takes issue with modernist Christians who entertain their babble. In Price’s opinion, “whatever it may be, [the] object of the Modernist’s faith is *something else* than God’s

³¹ *Selected Works of George McCready Price*, volume 7 of the 10 volume anthology *Creationism in Twentieth-Century America*, edited with introductions by Ronald L. Numbers (New York, NY: Garland Publishing, Inc., 1995), p. 116.

³² *Ibid.*, 125.

³³ *Ibid.*, 463.

³⁴ *Ibid.*, 73.

special revelation to mankind, the Bible.”³⁵ Price urges fundamentalist Christians to take an even more aggressive stance in their opposition of modern science, for in his view “it is a fact that the modern discoveries in heredity and variation, in embryology, and in geology, make the case against organic evolution vastly stronger than even most Fundamentalists have supposed.”³⁶ During the Scope’s trial, the prosecution made frequent reference to Price’s writings as they sought to bar evolution from the classroom. Price’s militant attitude against all theories of science that contradict the word of the Bible is a hallmark of young-earth creationism, and, given this attitude, it is no wonder why science and Christianity have met, and continue to meet in conflict.

In the 1980’s, the quarrel between these ideologies was once again thrown into the national spotlight. In 1981, then-Arkansas Governor, Frank White, signed-off on Act 590 which gave equal time to creation science and evolution in public schools. According to the act, the topics of creation science included the “sudden” creation of the universe from “nothing,” the “insufficiency” of mutation and natural selection in bringing about the diversity of life we find today from a single organism, the “separate ancestry of man and apes,” and the teaching of “catastrophism, including the occurrence of a worldwide flood.”³⁷ In 1982, the U.S. District Court overturned Act 590 on the grounds that it violated the First Amendment of the U.S. Constitution barring laws respecting a particular establishment of religion. While the basis of the court’s ruling resided in religious nondiscrimination, the court also ruled that creation science was not valid science, leaving the determination of scientific theory to the scientific community.

³⁵ George McCready Price, *The Predicament of Evolution* (Southern Publishing, 1925), Chapter 13 “Babylon the Great.”

³⁶ Numbers, *Selected Works of George McCready Price*, 252.

³⁷ Act 590 of 1981: General Acts, 73rd General Assembly, State of Arkansas. Section 4.

But the case cannot be made that young-earth creationists are simply ignorant of scientific knowledge because many of them have received schooling in scientific subjects, and now make their careers in scientific fields. In 2001, Australian food scientist and young-earth creationist John Ashton put together a book titled *In Six Days: Why 50 Scientists Choose to Believe in Creation* which is a collection of short essays by people that hold either Ph.D.'s or M.D.'s who believe in creationism. These scientists and doctors acknowledge and respect the findings of science, but they believe nonetheless in the creation narrative of the Bible. One essay in the book was written by Kurt Wise, who received a Ph. D. in Geology at Harvard where he studied under Stephen Jay Gould, a prominent scholar on the science and religion controversy whom we will see in the *Independence* category. As an inquisitive teenager, Wise set himself to the task of cutting from the Bible with scissors every verse contradicted by science. When he was no longer able to lift the dissected book between his fingers, Wise faced the decision of whether to toss out science or the Bible. Wise's relationship with Christ took precedence:

[Jesus Christ] had become a real friend to me. He was the reason I was even alive both physically and spiritually. I could not reject Him. Yet, I had come to know Him through His Word. I could not reject that either. It was there that night that I accepted the Word of God and rejected all that would ever counter it, including evolution. With that, in great sorrow, I tossed into the fire all my dreams and hopes in science.³⁸

Wise concludes by writing, "I am a young-age creationist because that is my understanding of Scripture ... if all the evidence in the universe turned against

³⁸ Essay by Kurt Wise in *In Six Days: Why 50 Scientists Choose to Believe in Creation*, edited by John F. Ashton (Green Forest, AR: Master Books, 2001), p. 354.

creationism, I would be the first to admit it, but I would still be a creationist because that is what the Word of God seems to indicate.”³⁹

This understanding rings true for many creationists and biblical literalists. No matter what the experimental evidence of science indicates, the word of the Bible is a trumping truth for many Christians. But can we discard scientific evidence so readily? After all, evidence is what gives us *reason* to believe something. The sentence of a person on trial for murder depends entirely on the evidence of the case. Surely, if you were wrongly on trial for murder, you would want the evidence indicating your innocence to be respected and recognized as the truth. In medicine, doctors proscribe drugs and perform surgeries only when there is sufficient evidence to do so. Why is it acceptable to look past evidence and reason in the name of religion, then require unquestioningly in so many other areas of human life?

Today, as nearly one-third of Americans believe in biblical literalism, the movement remains at full force. Creationists continue to take issue with the teaching of evolution in the classroom. In May of 2005, prompted by the Discovery Institute’s “Teach the Controversy” campaign, the Kansas State Board of Education entertained a series of hearings aimed at getting intelligent design and the uncertainties of evolution taught in the science classroom, but the motion was ultimately rejected. Also in 2005, a group of Pennsylvania parents rallied to keep intelligent design out of the classroom by drawing attention to its primarily religious connotation which put it in violation of the First Amendment.⁴⁰ Creationist advocates and authors continue to undermine the scientific community. They deny evolution and the shared ancestry of humans and apes,

³⁹ Ibid., 355.

⁴⁰ See Gordy Slack, *The Battle Over the Meaning of Everything: Evolution, Intelligent Design, and a School Board in Dover, PA* (San Francisco, CA: Jossey-Bass, 2007).

they point to a lack of transitional fossils in the fossil record, and they claim there is no reliability in the nuclear decay rates used for radiometric dating which perforates all arguments from archeology, geology, and biology that rely on such dating techniques. In Kentucky, a creation museum opened in 2007 and it has attracted nearly two million visitors to date. The museum is owned and operated by a group of *Christian apologists* (those who defend a rational basis for the Christian faith and its theology) and is dedicated to promoting the views of young-earth creationism. One of the exhibits depicts children playing and living in peace beside animatronic dinosaurs. Most scientific materialists would consider such an exhibit a slap in the face.

The *Conflict* thesis is our baseline when it comes to discussing the relationship between science and Christianity. In many ways, it seems that Galileo's historic condemnation by the Roman Catholic Church set these worldviews on a collision course. Both scientific materialists and biblical literalists believe science and Christianity make contradicting claims about the same reality, therefore, they are fundamentally incapable of coexisting. For the scientific materialist, the sole reality of the universe is matter and energy, scientific truths are the only reliable truths, and the existence of human beings is simply a fortunate coincidence. Most scientific materialists, like Hitchens, Dawkins, Dennett, and Harris, believe Christianity and the other religions of the world are impediments of human progress. Conversely, for the biblical literalist, young-earth creationist, or Christian fundamentalist the story of the Bible is a factual account of the history of life and the universe, and the scientific enterprise is too frequently associated with atheist agendas. The fact that a third of the American population believes the Bible is literally true reveals how deeply the Christian

message resonates in our daily lives. But the fact that our cars, computers, and cell phones work at all is a testament to the truth of the scientific enterprise. Can science and Christianity make competing claims about reality and exist in harmony? Barbour believes the *Conflict* thesis reflects ignorance and an inability to adapt from both sides of the controversy. We will see more of Barbour's opinion on the *Conflict* category in the final section. The ideologies ahead overcome the apparent struggle between science and Christianity. Perhaps it will be one of these ideologies that holds the answer to reconciling science and Christianity in the end.

III. Independence

The central dogma of the *Independence* category is that science and Christianity describe non-overlapping realms of the human experience. Science describes what nature is and how it operates, while Christian doctrine describes why we are here, and how we ought to live. Recognizing and respecting the distinct roles of these worldviews promotes harmony and cooperation, while avoiding the prejudice and strife typical of the *Conflict* category. According to Barbour, this "separation into watertight compartments is motivated not simply by the desire to avoid unnecessary conflicts, but also by the desire to be faithful to the distinctive character of each area of life and thought."⁴¹ We will follow Barbour through *neo-orthodox Christianity*, *existentialism*, and *linguistic analysis* where we will highlight Protestant theologian Langdon Gilkey's

⁴¹ Barbour, *Religion and Science*, 84.

advocacy of the *Independence* approach, then conclude with Stephen Gould's *non-overlapping magesteria*, a perspective that is absent from Barbour's analysis.

The worldview of *neo-orthodox Christianity* began in the early-twentieth century, and it partitions science and Christianity into independent spheres. The movement aims "to recover the Reformation emphasis on the centrality of Christ and the primacy of revelation," while opposing liberal Christianity with its elements of natural theology which were incorporated in the wake of Darwinism.⁴² Neo-orthodoxy backs a biblically-based theology while remaining permissive of scientific knowledge. Here, science and Christianity coexist because they use different methods to explore different domains. Karl Barth, considered by many as the "father of neo-orthodoxy," was a Swiss pastor and theologian, and he envisioned a Christianity based on God's transcendence and revelation, not on the literal word of the Bible. In a letter to his grandniece written in 1965, Barth says the comparison between the creation story of the Bible and science's theory of evolution is like comparing "an organ and a vacuum-cleaner." He goes on to say, "The creation story is a witness to the beginning or becoming of all reality distinct from God in the light of God's later acts and words relating to the people of Israel – naturally in the form of a saga or poem. The theory of evolution is an attempt to explain the same reality in its inner nexus – naturally in the form of a scientific hypothesis." In other words, the scope of Christianity encompasses and moves beyond the scope of science. When scientific hypotheses fall short, Christianity gives us resources that take us beyond our epistemological limits. We leave Barth with his capsulizing remark, "The creation story deals only with the becoming of

⁴² Ibid., 85.

all things, and therefore with the revelation of God, which is inaccessible to science as such.”⁴³

Neo-orthodox Christianity, as it comes down to us from Barth, keeps science and Christianity at a safe distance from one another, thereby avoiding conflict. The Bible is not literally true, it is the human record of God’s revelation to mankind through Christ which is the sole source of true Christian doctrine and direction. God is ultimately responsible for the existence of the universe, and science merely tells us how this universe works. Science has no authority to answer questions about the purpose of the universe or the purpose of human life. Science simply has no bearing on the quest to live a Christian life. We will explore Barbour’s personal stance on neo-orthodoxy at the end of this work.

The next ideology on our docket is *existentialism*. Existentialism keeps science and Christianity at bay by drawing boundaries between the *subjective* and *objective* domains of human life. The subjective is the domain of the individual, thinking self, and the objective is the domain of impersonal objects and events. Rather than turning to Christ and God’s revelation for answers about authentic human behavior, like neo-orthodoxy, the existentialist turns inward to validate life with personal commitment and action, as demonstrated in John Cobb and David Griffin’s remark, “What we are as humans beings is not decided for us by God, by society, or by our personal past, we decide in the act of existing.”⁴⁴ In other words, the individual is responsible for finding and sustaining meaning in his or her life, not society or religion. For the existentialist,

⁴³ *Karl Barth Letters 1961 – 1968*, edited by Jurgen Fangmeier and Hinrich Stoevesandt, translated and edited by Geoffrey Bromiley (Grand Rapids, MI: William B. Eerdmans Publishing Company, 1981), p. 184.

⁴⁴ John Cobb and David Griffin, *Process Theology: An Introductory Exposition* (Louisville, KY: Westminster John Knox Press, 1976), p. 81.

science explores the objective realm with the tools of logic and reason, while Christianity, and the other world religions, guide the individual to live as one's truest self.

Existentialism owes much of its beginnings to the nineteenth-century philosophy of Soren Kierkegaard, "a poet against poetic life, a Christian against Christendom, a thinker against philosophy."⁴⁵ Kierkegaard sought a return to Christianity as it was practiced in its infantile stages in ancient Rome. For Kierkegaard, "the problem is not about the truth of Christianity but about the individual's relation to Christianity."⁴⁶ In other words, Christianity is a journey in the subjective realm, not the objective realm. Kierkegaard emphasizes the "how" of Christianity, and this "how" can only be understood in light of the "absolute paradox."⁴⁷ The absolute paradox is "the proposition that God has come into being in human form, was born, grew up, etc.," and it is solely the one who has faith who relates to the absolute paradox.⁴⁸ True Christian life is an austere life marked by existentialist introspection. In fact, for Kierkegaard, the absurd leap of faith that is the movement of believing absolutely in God, is beyond the reach of reason, it is intrinsically irrational. In other words, there is no logical path to faith, therefore science has little to no authority to comment on matters of faith. This constitutes the primary distinction between science and Christianity for Kierkegaard. In summation, "the difference is simply that science and scholarship want to teach that

⁴⁵ Edward Mooney, *Knights of Faith and Resignation: Reading Kierkegaard's Fear and Trembling* (Albany, NY: State University of New York Press, 1991), p. 2.

⁴⁶ Soren Kierkegaard, *Concluding Unscientific Postscript to Philosophical Fragments – Volume I*, edited and translated by Alastair Hannay (New York, NY: Cambridge University Press: 2009), p. 16.

⁴⁷ *Ibid.*, 514.

⁴⁸ *Ibid.*, 182.

becoming objective is the way, whereas Christianity teaches that the way is to become subjective, that is, truly to become a subject.”⁴⁹

Interestingly, twentieth century Lutheran theologian Rudolf Bultmann advocates a blending of neo-orthodox Christianity and existentialism. For Bultmann, the Christian is saved through faith in Christ, and “faith involves a new existential understanding of Self,” where man “realizes his creatureliness and guilt.”⁵⁰ He upholds the separation of science and Christianity as “they are affirmed from different points of view, and are about events in different realms.”⁵¹ In Bultmann’s opinion, modern science has exposed the mythical character of Christianity. In response, he calls for the “de-mythologization” of Christianity to rescue and bring focus to the core elements of the religion. De-mythologization is an effort to “clear away the false stumbling blocks created for man by the fact that his world view is determined by science,” and “the task of de-mythologizing has no other purpose but to make clear the call of the Word of God.”^{52, 53} When we read and interpret the Bible, we ought to shed the stigma of objectivism to see more clearly the subjective focus of the Christian message. According to Bultmann, we cannot view “God as an objective entity,” we ought to understand the Bible and the will of God in terms of “hopes and fears, choices and decisions, and new possibilities for our lives.”^{54, 55} Bultmann’s existentialist interpretation of Christianity upholds the separation of science and Christianity as non-

⁴⁹ Soren Kierkegaard, *Concluding Unscientific Postscript to Philosophical Fragments – Volume 1*, edited and translated by Howard and Edna Hong (Princeton, NJ: Princeton University Press, 1992), p. 131.

⁵⁰ Rudolf Bultmann, *The Making of Modern Theology: Interpreting Faith for the Modern Era* (Minneapolis, MN: Fortress Press, 1991), p. 197.

⁵¹ Cobb and Griffin, *Process Theology*, 160.

⁵² Rudolf Bultmann and Karl Jaspers, *Myth and Christianity: an Inquiry into the Possibility of Religion Without Myth* (New York, NY: The Noonday Press, 1958), p. 59.

⁵³ Bultmann, *The Making of Modern Theology*, 304.

⁵⁴ *Ibid.*, 67.

⁵⁵ Barbour, *Religion and Science*, 86.

overlapping enterprises, but his call for the de-mythologization of Christianity in light of scientific knowledge is a perspective of the *Dialogue* variety.

A third type of perspective that falls within the scope of the *Independence* thesis is the perspective that science and Christianity are different languages with different functions in the human experience. For the *linguistic analyst*, to use Barbour's words, *scientific language* is used "primarily for prediction and control." It describes nature with theories that are "useful tools for summarizing data, correlating regularities in observable phenomena, and producing technological applications." On the other hand, *religious language* recommends a specific way of life, elicits certain attitudes, and encourages allegiance to particular moral principles.⁵⁶ For Barbour, this formula of separation is "more effective" than the formulas of neo-orthodoxy and existentialism.

American theologian George Lindbeck is an advocate of the linguistic approach to science and Christianity. In his book *The Nature of Doctrine*, he provides a brilliant overview of the religious landscape we find ourselves in today, one that Barbour gives due consideration in his own book. For Lindbeck, all forms of religious understanding condense down to three general categories: the *propositional* perspective, the *experiential-expressive* perspective, and the *cultural-linguistic* perspective. First off, the propositional perspective is the approach of traditional orthodoxies, where church doctrine functions as "informative propositions or truth claims about objective realities." Biblical literalists and creationists exhibit this line of thinking. Secondly, with the experiential-expressive perspective, "religiously significant meanings can vary while doctrines remain the same." If doctrines are interpreted as "noninformative and

⁵⁶ Ibid., 87.

nondiscursive symbols of inner feelings, attitudes, or existential orientations,” then the historical truth of the doctrine is irrelevant. Here, the Bible is understood symbolically rather than literally. Finally, in the cultural-linguistic perspective, which is “favored by ecumenically inclined Roman Catholics,” and by Lindbeck himself, the two preceding perspectives are combined. Church doctrines are important for how they are used, “not as expressive symbols or truth claims, but as communally authoritative rules of discourse, attitude and action.”⁵⁷ In other words, Christianity is first and foremost a culture, a language, or a way of life. However, Lindbeck realizes this approach is really only useful for the “nontheological study of religion.”⁵⁸ It does not reflect the journey of the individual to live like Christ and foster a relationship with God. Nonetheless, it is possible to understand Christianity as a cultural-linguistic system, and for Lindbeck, this perspective keeps Christianity far enough away from science to avoid conflict.

The linguistic approach to science and Christianity hides an important distinction between scientific and religious language. Science can indeed be understood as a specific language with specific functions, just like Christianity or the other world religions can be understood. But this understanding hides the fact that science uses only one language, the language of mathematics, while the religions of the world lack this overarching connection. Each individual religion must be understood in terms of its unique sacred texts and tradition which varies from religion to religion. But science is united by mathematics, as all scientific disciplines use mathematics to understand nature. While the linguistic approach upholds the distinctive features of science and

⁵⁷ George Lindbeck, *The Nature of Doctrine: Religion and Theology in a Postliberal Age* (Louisville, KY: Westminster John Knox Press, 1984), p. 16-22.

⁵⁸ *Ibid.*, 25.

religion, it has no ability to account for the universal language of science, for which religion has no equal.

Drawing from his experiences as a prisoner of war during World War II, his Protestant upbringing, and his education in religion, Langdon Gilkey developed a unique understanding of Christian theology that does not conflict with scientific knowledge. For Gilkey, the core message of Christianity is that faith in Christ is the avenue to God's love and grace, and this is a separate manner entirely from science and its business of investigating the material universe. These ideologies can coexist so long as they keep to their respective affairs and avoid encroaching on the territory of the other. For Gilkey, religious meaning differs from person to person, and it depends on the historical, societal, and cultural situation of the individual. By this thinking, science and technology are simply new factors bearing on the path of righteous Christian living through Christ, but they pose no ultimate threat to the livelihood of the Christian tradition. Gilkey writes, "In science there is nothing that corresponds to or can conceivably conflict with either a metaphysical understanding of origins or with the theological doctrine of creation."⁵⁹ He elaborates further in the following quote, showing true allegiance to the *Independence* thesis:

None of these new [scientific] theories touched, or challenged, the deeper religious understanding of God as primary cause working through second causes, however we may come to understand the latter through scientific inquiry. So understood, science is no threat to Christianity – but then religious theory is limited to its proper arena, namely, to talking about God in relation to nature, and not about the sequences of natural causes in and of themselves.⁶⁰

⁵⁹ Langdon Gilkey, *Maker of Heaven and Earth: the Christian Doctrine of Creation in Light of Modern Knowledge* (Garden City, NY: Doubleday and Company, 1965), p. 17.

⁶⁰ Langdon Gilkey, *Creationism on Trial: Evolution and God at Little Rock* (Minneapolis, MN: Winston Press, 1985), p. 52.

Here, science concerns itself with the inner-workings of nature, while Christianity focuses on the relationship between God, nature, and the individual.

In a later book about his experience as a witness in the trial of *McLean v. Arkansas Board of Education*, Gilkey describes four ways in which science and religion in general differ from one another. Barbour highlights the same four distinctions in his book, but we reiterate them here as they form a great synopsis of the *Independence* perspective. First, “science moves entirely in the sphere of objective, public experience; religion is more apt to point to special, inward, unusual, shattering, or healing experiences.” Second, science is concerned with the material universe and asks about “the character and process of change,” while religion asks questions like “Why is there anything at all?” and “Why are we here?” Third, the authority of science is “logical coherence and experimental adequacy,” while the authority of religion is “God, or the point where our relation with God appears.” Lastly, “the language of science is quantitative, mathematical, [and] precise,” meanwhile “religious language refers to God, an intelligent, purposive being or reality, one who is transcendent, that is, who is *not* part of the system of creaturely things but precisely their source and ground.”⁶¹ Gilkey’s was an important testimony during the trial because if science and Christianity have nothing to do with each other, then surely creationism and intelligent design have no business in a science classroom.

The fifth and final partition of science and Christianity in this *Independence* category is the perspective of paleontologist, evolutionary biologist, and scientific

⁶¹ Ibid., 108-113.

historian, Stephen Gould. His *non-overlapping magesteria* holds these ideologies at bay by keeping them isolated. In Gould's own words:

I do not see how science and religion could be unified, or even synthesized, under any common scheme of explanation or analysis; but I also do not understand why the two enterprises should experience any conflict. Science tries to document the factual character of the natural world, and to develop theories that coordinate and explain these facts. Religion, on the other hand, operates in the equally important, but utterly different, realm of human purposes, meaning and values – subjects that the factual domain of science might illuminate, but can never resolve ... I propose that we encapsulate this central principle of respectful noninterference – accompanied by intense dialogue between the distinct subjects, each covering a central facet of human existence – by enunciating the Principle of NOMA, or Non-Overlapping Magesteria.⁶²

Gould not only rejects the notion that science and Christianity should meet in conflict, but he also dismisses attempts to unify or synthesize the two into a common metaphysical scheme. Within these magesteria, “each domain of inquiry frames its own rules and admissible questions, and sets its own criteria for judgment and resolution.”⁶³ Barbour does not address Gould's non-overlapping magesteria in his book, not because he is ignorant of Gould's ideas or biased against them, but simply because Barbour's work was published in 1997, two years before Gould published the concept of NOMA in 1999. I have no doubt that had the idea been accessible to Barbour, he would have included it here in the *Independence* category.

The approaches of the *Independence* thesis which we have just seen take a unique approach to reconciling science and Christianity. Science and Christianity are concerned with different realms of the human experience. Conflict is not possible because these worldviews never come in contact with one another. Neo-orthodox

⁶² Stephen Jay Gould, *Rocks of Ages: Science and Religion in the Fullness of Life* (New York, NY: The Ballantine Publishing Group, 1999), p. 4-5.

⁶³ *Ibid.*, 52.

Christianity maintains this position by guiding Christians with God's revelation, while science investigates the mechanisms of the universe as created by God. In existentialism, science deals with the objective domain of nature's material and causes, while Christianity is a matter of individual satisfaction and fulfillment in his or her personal relationship with God. For the linguistic analysis, science and Christianity are understood as different languages that make sense only in their specific contexts. Gilkey's testimony, which painted an image of science and Christianity as separate enterprises, helped convince the state of Arkansas that creation science indeed had no place in the science classroom. If we use the word "magesteria" rather than "languages," we arrive at Gould's NOMA in place of the linguistic view. The distinctions between science and Christianity are the same, only the terminology is different. As we will see in the final section, Barbour does not believe science and Christianity are fundamentally independent enterprises, but he does believe there are valuable lessons to be extracted from the particular ideologies of this section which encourage cooperation and harmony between these worldviews.

IV. Dialogue

Those who approach science and Christianity with ideologies of the *Dialogue* variety believe these enterprises are two necessary components of one overarching metaphysical explanation. American theologian John Haught, who referred to this as the "Contact" category, says the goal here is "consonance" as "science shapes religious and

theological understanding.”⁶⁴ For the authors of this approach, modern scientific knowledge is true and should be respected as such, but this knowledge is incomplete and insufficient. We must turn to Christianity when science runs out of answers. Barbour focuses on three categories of perspectives that bring science and Christianity into contact: *presupposition* and *limit questions*, *methodological parallels*, and *nature-centered spiritualities*. These categories will be our general guide, but there are ideas which Barbour does not address that we ought not to overlook, like the idea that science often evokes strong religious feelings, certainly this is a commonality with the potential to promote dialogue.

How better to introduce this category than with the words of a former pope? In an international conference at the Vatican in June of 1988, Pope John Paul II said the following regarding the dialogue or “relational unity” between science and Christian theology, “Science can purify religion from error and superstition; religion can purify science from idolatry and false absolutism. Each can draw the other into a wider world, a world in which both can flourish.”⁶⁵

Dinesh D’Souza is a conservative political advisor, commentator, and author. He shares Pope John Paul II’s perspective on the relationship between science and Christianity, and he claims that the latter presupposes the former, as well as answers questions the former cannot answer. D’Souza has made a name for himself as a Christian apologist and advocate of intelligent design (we will address intelligent design in the *Integration* category). He has met many proponents of new atheism in public debate, including Hitchens, Harris, and Dennett. In his book *What’s So Great About*

⁶⁴ Haight, *Science and Religion*, 9.

⁶⁵ See *Physics, Philosophy, and Theology: A Common Quest for Understanding*, edited by Robert Russell, William Stoeger, and George Coyne (Notre Dame, IN: University of Notre Dame Press: 1988).

Christianity?, D’Souza makes the case that humanity is better for Christianity in contrast to the common atheist or scientific materialist contention that some elements of Christianity might hold humanity back. He upholds the truth of the scientific narrative, from the Big Bang to human beings, but believes the God of Christianity presupposes this description of reality. Reminiscent of Aristotle or Aquinas’ conception of God as First Cause, D’Souza writes, “The universe that came into being in a primeval explosion fifteen billion years ago did not cause itself. It was caused or created, which means there had to be a creator. To the creator we give the name God.”⁶⁶ This is precisely the form of thinking which Barbour meant by the notion of a “limit question,” or an “ontological question raised by the scientific enterprise but not answered by the methods of science.”⁶⁷ It is true that scientists do not currently know what preceded or caused the Big Bang, so, for D’Souza, this is a reasonable place to invoke Christian theology.

For an even better illustration of the *Dialogue* approach from D’Souza, we need only recount his opening statement at the “La Ciudad de Las Ideas” event of 2009, the same event that featured the miniature boxing ring as a stage. In beginning his speech, D’Souza argued that science had no authority to answer “life-orienting” questions, like “why is there a universe,” “why are we here,” and “where are we going [once we die].” For answers to these questions we must turn to Christianity. In this way, science and Christianity engage in a dialogue to describe all of reality. There are limits to what science can tell us about the universe and about human nature, but Christianity takes us beyond those limits.

⁶⁶ Dinesh D’Souza, *What’s So Great About Christianity?* (Washington D.C.: Regnery Publishers, 2007), p.126.

⁶⁷ Barbour, *Religion and Science*, 90.

Barbour presents three Roman Catholic authors who believe that science and Christianity come into contact at the limits of human knowledge, all of whom are ordained priests who believe Christian theology presupposes scientific understanding. The first of which is Roman Catholic priest and philosopher of science, Ernan McMullin, who opposes scientific realism and argues that accepting scientific knowledge doesn't necessarily require the belief that it is true. He writes, "Science aims at fruitful metaphor and at ever more detailed structure."⁶⁸ According to Barbour, McMullin believes the story of Genesis is not an explanation of cosmological beginnings, "but an assertion of the world's absolute dependence on God in every moment."⁶⁹ McMullin supports the idea that God chose the initial conditions and physical laws of the universe, similar to D'Souza's position. The second priest Barbour mentions is German Jesuit priest Karl Rahner who reconciles Christian doctrine with the theory of evolution. Rahner believes that "the modern theory of evolution does itself recognize a self-transcendence of the lower to the higher."⁷⁰ This "self-transcendence" is the element of spirit in man, which not only comes from God, but eludes scientific explanation. Thus science only reveals a portion of the whole picture of reality. Rahner argues that mankind is singled-out by, and inseparable from God's grace. Lastly, Barbour turns to American Roman Catholic theologian David Tracey who believes that "at the limit of both the scientific and the moral enterprises, there inevitably emerge

⁶⁸ Ernan McMullin, "A Case for Scientific Realism" in *Scientific Realism* edited by Jarrett Leplin (Berkeley, CA: University of California Press, 1985), p. 35.

⁶⁹ Barbour, *Religion and Science*, 91.

⁷⁰ Karl Rahner, "Natural Science and Reasonable Faith: Theological Perspectives for Dialogue with the Natural Sciences," in *Theological Investigations XXI*, translated by Hugh Riley (New York, NY: Crossroads Publishing, 1988), p. 44.

questions to which a response properly described as religious is appropriate.”⁷¹ We see also a glimpse of what Barbour calls a “methodological parallel” in Tracy’s remark that there is “a ‘religious dimension’ to the scientific enterprise itself.”⁷² We will address this methodological parallel in more detail later in this section.

This discussion of limit questions in science would not be complete if we did not mention Henry Drummond’s “God-of-the-Gaps,” the main idea of which is that God is inserted wherever there are gaps in the scientific knowledge. Drummond writes, “There are reverent minds who ceaselessly scan the fields of Nature and the books of Science in search of gaps – gaps which they can fill up with God.” But this squeezes God into a rather unenviable and irreverent position, “When things are known, that is to say, we conceive them as natural, on Man’s level; when they are unknown, we call them divine – as if our ignorance of a thing were the stamp of its divinity.... is God only to be found in the disorders of the world?” Not surprisingly, rather than an intermittent God-of-the-Gaps, Drummond favors the notion of an “immanent God, which is the God of Evolution.” Evolution is not a progress of matter, but a “progress in spirit,” “which is at once most human, most rational, and most divine.”⁷³

No matter how unsettling Drummond’s God-of-the-Gaps may be for many Christians, it is possible that it portrays a fundamental truth about the progress of the scientific enterprise. Prior to the sixteenth century, God was responsible for the motion of the sun around the earth until Copernicus, Galileo, Kepler, Newton, and others proved otherwise. Prior to 1859, God was responsible for creating life as we know it

⁷¹ David Tracey, *Blessed Rage for Order* (Chicago, IL: University of Chicago Press, 1996), p. 94.

⁷² *Ibid.*, 95.

⁷³ Henry Drummond, *The Ascent of Man* (New York, NY: Cosimo Classics Publishing, 2007), p. 333-335.

until Darwin published the theory of evolution and gave life a scientific explanation. Furthermore, in the minds of many, the scientific knowledge of the Big Bang has effectively reduced God to a mysterious, deistic being who caused the universe to come into existence then disappeared. Regardless of whether or not Christian theology is in fact losing ground to science, the notion of the God-of-the-Gaps is a perfect example of how science and Christianity can intersect at the limits of knowledge.

For the authors who claim there are *methodological parallels* between science and Christianity, these worldviews do more than interact at limits or gaps. There are deeper similarities that pull science and Christianity into a dialogue with one another. Thomas Kuhn's understanding of paradigms is but one illustration of the similarities between these worldviews. In 1962, Kuhn published *The Structure of Scientific Revolutions* in which he makes the case that scientific progress is subject to the flux of paradigms. Paradigms, according to Kuhn, are scientific ideas that are "sufficiently unprecedented to attract an enduring group of adherents away from competing modes of scientific activity," and these paradigms are "sufficiently open-ended to leave all sorts of problems for the redefined group of practitioners to solve."⁷⁴ In other words, paradigms are the popular, or most current scientific understanding of the time, and this understanding bears on the future course of scientific progress. Paradigms gather momentum by receiving validation through a system of peer review; as more and more scientists judge an idea to be true the more entrenched that idea becomes. Furthermore, as noted by Barbour, the notion of paradigms can be applied to Christianity just as it can be applied to science. For Barbour, "religious experience and historical events" are

⁷⁴ Thomas Kuhn, *The Structure of Scientific Revolutions: 50th Anniversary Edition* (Chicago, IL: University of Chicago Press, 2012), p. 10-11.

“even more paradigm-dependent than in the case of science,” and “even more resistant to falsification.”⁷⁵ While the scientific enterprise may be laced with paradigms as Kuhn contends, there are almost surely some scientific facts that transcend peer-review and popular opinion, take gravity for example. Perhaps science and Christianity are not entirely reducible to paradigmatic thinking.

Some methodological parallels between science and Christianity invert the traditional existentialist distinction between the subjective and objective spheres. Whereas classical science told us that the subjective scientist was independent of his or her objective experiment, recent discoveries in modern science suggest that the scientist may play a more direct role in the outcome of his or her experiment. Barbour under-emphasizes these discoveries in his analysis. Understanding the relationship between the scientist and his experiment is a task for twenty-first century science as twentieth century science merely uncovered the mystery. As British philosopher Stephen Toulmin put it, “the scientist as spectator is dead.”⁷⁶

The idea of the detached observer of science has been crumbling since 1905. In this year, Einstein developed the theory of general relativity which contends that the mass and velocity we measure for a particular object depends on our frame of reference. In the 1920’s, German physicist Werner Heisenberg showed that, at the quantum level, the very act of observation limits how precisely a particle’s position and momentum can be known. The famous double-slit experiment of the nature of light elucidates another odd interaction between the scientist and his or her experiment. Under normal conditions, shining light of one wavelength through a vertical slit produces a repeating

⁷⁵ Barbour, *Religion and Science*, 93.

⁷⁶ Stephen Toulmin, *The Return to Cosmology: Postmodern Science and the Theology of Nature* (London, England: University of California Press, 1982), p. 252.

pattern of illuminations on a screen, an “interference pattern” caused by interfering waves of light. But when particle detectors are used to observe which slit a given photon passes through, the interference pattern disappears and light behaves only as a particle, producing a single vertical, illuminated slit on a screen. These theories and experiments suggest that science is not as objective as people once thought, and that there is much left to learn about the connection between humanity and nature.

Unfortunately, there is little hope of understanding how these findings bear on Christian doctrine until science has a more complete grasp of these ideas.

For physicist and theologian John Polkinghorne, and philosopher Holmes Rolston, there are a whole host of parallels between science and Christianity that bring the two together in collaboration, and Barbour makes references to these authors as well. For Polkinghorne, we can view the Bible and the historical tradition of Christianity as religious data. A dialogue between science and Christian theology is possible because “both involve corrigible attempts to understand experience. They are both concerned with exploring, and submitting to, the way things are ... theology explaining the source of the rational order and structure which science both assumes and confirms in its investigation of the world.”⁷⁷ Similarly, for Rolston, science and Christianity “share the conviction that the world is intelligible [and] susceptible to being logically understood,” but they arrive at this conclusion by different means. “Science operates with the assumption that there are causes to things, [Christianity] with the presumption that there are meaning to things.”⁷⁸ Here, meaning is derived only from

⁷⁷John Polkinghorne, *One World: The Interaction of Science and Theology* (West Conshohocken, PA: Templeton Foundation Press, 2007), p. 115.

⁷⁸Holmes Rolston, *Science and Religion: A Critical Survey* (West Conshohocken, PA: Templeton Foundation Press, 2006), p. 22.

“particulars” in their “gestalt.” For Polkinghorne and Rolston, science and Christianity both understand the world to be inherently ordered and logical, but neither can fully understand existence without the other.

Besides those who believe that Christianity presupposes science, or that Christianity and science overlap at natural limits, or that the two are similar because they share methodological parallels, there are those who advocate a *spirituality of nature*. Barbour says, “The term *spirituality* refers to a religious outlook based on individual experience rather than on religious institutions or formal theological doctrines.”⁷⁹ For these authors, nature is the ultimate source of inspiration. Natural landscapes and events have aroused powerful emotions in people for millennia, and today is no different. This movement can be traced back to the Romantics of the eighteenth century and the naturalists of the nineteenth century. Both groups sought to preserve the sacred in nature through music, art, literature, and poetry while combating the desecration of nature brought on by Enlightenment rationalization and the industrial revolution. Because we have limited our discussion to the Christian religion, the majority of Barbour’s work in this section is outside the scope of this project. Nonetheless, there are a few important authors and ideas worth mentioning, particularly Brian Swimme and Thomas Berry who envision a universal law code inspired by science that protects humanity and nature equally.

Together, Brian Swimme, a mathematical cosmologist, and Thomas Berry, a Roman Catholic priest and ecotheologian, wrote *The Universe Story*, a modern, comprehensive story of the universe that endeavors to give meaning to life and to

⁷⁹ Barbour, *Religion and Science*, 95.

existence itself, as similar stories have done throughout human history.⁸⁰ For Swimme and Berry, there is an avenue to dialogue between science and Christianity in that each is part of human history as well as cosmological history. From science, we can learn about the materials and mechanisms of the universe, while Christianity, along with the other world religions, sheds light on the human being, and his or her role in the cosmos. Barbour writes, “[Swimme and Berry] call for a universal science-based myth or cosmic story in place of the conflicting stories of particular traditions, so that the global community can unite to preserve a planet facing environmental destruction.”⁸¹ Let the nature that science knows be the inspiration for a new narrative of existence. One that overcomes our differences and illuminates the similarities between us. One that translates the ideas of self-worth, meaning, and camaraderie we gain from religion into a universal story based on nature in which all human beings can find solace. Perhaps, in the future, rather than singing hymns about Christ or God, we will sing hymns about the universe and the wonder of life. We can imagine that such hymns might resemble the remark made by Swimme in an interview with Susan Bridle for “What Is Enlightenment?” magazine: “This is the greatest discovery of the scientific enterprise: You take hydrogen gas, and you leave it alone, and it turns into rosebushes, giraffes and humans.”⁸²

The stance of Swimme and Berry leads us toward another avenue of dialogue between science and Christianity, one that Barbour mentions only fleetingly, but one

⁸⁰ Thomas Berry and Brian Swimme, *The Universe Story: From the Primordial Flaring Forth to the Ecozoic Era – A Celebration of the Unfolding of the Cosmos* (San Francisco, CA: HarperCollins Publishing, 1994), p. 1.

⁸¹ Barbour, *Religion and Science*, 96.

⁸² Quote from Brian Swimme in an interview with Susan Bridle of “What Is Enlightenment?” magazine, now known as “EnlightenNext,” Issue 19.

that merits our attention and elucidation. This avenue is the religiosity of science. Throughout history, science has been a source of awe and wonder for many scientists. The rationality of the natural order, the overwhelming scale of the universe, and the role of chance in creating conscious life are but some of the scientific ideas that inspire the kind of reverence typically reserved for religious inspirations.

Albert Einstein's understanding of science inspired religious experiences and feelings. He epitomizes the *Dialogue* thesis with his famous statement, "science without religion is lame, [and] religion without science is blind."⁸³ But the relationship between science and religion runs much deeper than collaboration for Einstein, for he believes there is a beauty in scientific knowledge, a beauty not unlike the emotions inspired by religious ideas. For Einstein, science provides "a knowledge of the existence of something we cannot penetrate, of the manifestations of the profoundest reason and the most radiant beauty, which are only accessible to our reason in their most elementary forms - it is this knowledge and this emotion that constitute the truly religious attitude."⁸⁴ In fact, for Einstein, the religious feelings aroused by science are more pure and real than the religious feelings aroused by religion. Science shapes religion and theology by chiseling away the doctrine of a personal God to reveal a truer religiosity beneath it all. Einstein writes:

To be sure, the doctrine of a personal God interfering with natural events could never be *refuted*, in the real sense, by science, for this doctrine can always take refuge in those domains in which scientific knowledge has not yet been able to set foot. But I am persuaded that such behavior on the part of the representatives of religion would not only be unworthy but also fatal. For a doctrine which is able to maintain itself not in clear light but only in the dark will of necessity lose its effect on mankind, with

⁸³ Albert Einstein, "Science and Religion," 1940, *Nature*, **146**, 606.

⁸⁴ Albert Einstein, *The World as I See It*, translated by Alan Harris (Secaucus, NJ: Citadel Press, 2000), p. 5.

incalculable harm to human progress... Thus it seems to me that science not only purifies the religious impulse of the dross of its anthropomorphism, but also contributes to a religious spiritualization of our understanding of life.⁸⁵

Perhaps this Einsteinian type of religion is a glimpse of the future of religion. It upholds the truth of scientific knowledge while preserving the transcendental feelings that elevate us beyond the mundaneness of our lives, the very feelings that validate religion in the first place.

Einstein is by no means the only scientist to experience such grandeur from the scientific enterprise. For astronomer and science popularizer Carl Sagan, realizing our place in the cosmos is a profoundly spiritual realization. Sagan writes:

In its encounter with Nature, science invariably elicits a sense of reverence and awe. The very act of understanding is a celebration of joining, merging, even if on a modest scale, with the magnificence of the cosmos... Science is not only compatible with spirituality; it is a profound source of spirituality. When we recognize our place in an immensity of light-years and in the passage of ages, when we grasp the intricacy, beauty, and subtlety of life, then that soaring feeling, that sense of elation and humility combined, is surely spiritual.⁸⁶

For Dawkins, science evokes some of the most powerful emotions we are capable of experiencing, emotions often expressed in the arts. He writes, "The feeling of awed wonder that science can give us is one of the highest experiences of which the human psyche is capable. It is a deep aesthetic passion to rank with the finest that music and poetry can deliver. It is truly one of the things that makes life worth living and it does so, if anything, more effectively if it convinces us that the time we have for living it is

⁸⁵ Albert Einstein, "Science and Religion," 606.

⁸⁶ Carl Sagan, *The Demon-Haunted World: Science as a Candle in the Dark* (New York, NY: Ballantine Books, 1997), p. 29.

finite.”⁸⁷ There are few experiences that rival the amazing sensation that falls over one upon looking up at the night sky and understanding that the atoms of one’s body were once inside stars. The scientific fact that we have evolved from microscopic organisms over billions of years ought to fill us with feelings of purpose so profound that we might be motivated to make the most of the fortune of being born human. For many, the beauty of nature is magnified when understood at the level of science. The religious dimension of science might prove to be an important avenue to reconciling science and Christianity, and science and religion in general. It reveals an important parallel between the two, but one that too few people have the fortune of experiencing.

The beauty of the *Dialogue* approach is that it overcomes the image of conflict between science and Christianity, not by separating them into watertight compartments like the approaches of the *Independence* thesis, but by recognizing the similarities and areas of overlap that bring them together. We saw with D’Souza, McMullin, Tracey, and Drummond how God can be a useful explanation when scientific explanation comes up short. For these authors, Christian theology lives at the limits of scientific knowledge. However, if we imagine a day when science does possess a complete story of the universe, then what limits or gaps are left for God? There are many methodological parallels between science and Christianity. One being the presence of paradigms in both of these enterprises as we saw with Kuhn. Another being the unavoidable effect of the scientist on his or her experiment, a phenomenon which blurs the boundaries between subjectivity and objectivity, as well as between science and religion in general. We saw other parallels with Polkinghorne and Rolston who contend

⁸⁷ Richard Dawkins, *Unweaving the Rainbow: Science, Delusion and the Appetite for Wonder* (New York, NY: First Mariner Books of Houghton Mifflin Company, 2000), p. x.

that science and Christianity both rely on the idea that the universe is ordered and intelligible. Swimme and Berry believe there is a spiritual dimension in nature, and since every human being is part of nature and dependent on nature, perhaps a universal spirituality could be articulated that transcends particular ideologies and unites humanity. This could also be achieved by harnessing the religiosity of science. Many scientists express awe and reverence at the scientific understanding of the universe. Perhaps a religion of science could be a popular religion. As we will see in the conclusion, Barbour is in general support of the *Dialogue* thesis, although he does not believe it offers a lasting answer to reconciling science and Christianity.

V. Integration

The approaches of the *Integration* category constitute the final topic on our docket. These approaches draw from both science and Christianity to create more complete metaphysical schemes than either can achieve individually. Barbour distinguishes between three areas of thought within this category: *natural theology*, *theology of nature*, and *systematic synthesis*. In a natural theology, nature as understood by science points to God above, or at least to an intelligent Designer. For a theology of nature, Christian doctrine is the starting point and adjustments are made to afford scientific knowledge. Finally, a systematic synthesis builds an inclusive metaphysical picture from pieces of both scientific and Christian doctrine. Haught, who called this the “Confirmation” category, says the worldviews herein are “extremely important”

perspectives that highlight “the ways in which, at a very deep level, religion supports and nourishes the entire scientific enterprise.”⁸⁸

One way that Christianity supports science is in the idea that former is the backdrop against which the latter makes sense and becomes whole, this is the position of natural theology. Natural theology is based on the idea that there is evidence in the scientific understanding of nature that suggests our universe was designed by an *Intelligent Designer*. For proponents of the intelligent design movement, science tells us how God created the universe to work. Everything from the Big Bang, to the condensation of stars and galaxies, to the emergence of life on earth, to the slow evolution of life into what we see today was all part of God’s initial plan. Forms of intelligent design have been around for centuries. Thomas Aquinas was one of the first to think along these lines. Reminiscent of God’s power to create *ex nihilo* in Genesis, Aquinas’ *cosmological argument* for a “First Cause,” or “Uncaused Cause,” articulates the necessity of an initial event or initiator that triggered the cascade of events which led to our universe as it is today. The “orderliness and intelligibility” of this cascade inspired Aquinas’ *teleological argument* which attributes the pattern, design, and order in nature to an intelligent being by whom “all natural things are directed to their end; and this being we call God.”⁸⁹

Descartes and Newton upheld similar versions of intelligent design, but their understandings tended more towards deism than theism. In all their genius, these men conceived of God as something of a divine watchmaker. Just as a watchmaker assembles a watch, winds its gears, then leaves it alone to function as it was designed,

⁸⁸ Haight, *Science and Religion*, 9.

⁸⁹ Thomas Aquinas, *Summa Theologica* (New York, NY: Benziger Bros., 1948) Article 3, Question 2, p. 14. See also Barbour, *Religion and Science*, 98-99.

God created the universe and put all the pieces in motion to produce a life-sustaining universe. Descartes' determinism and rationalism left him with only a deistic designer, one that toppled the first domino but who hasn't intervened in creation since. Newton, on the other hand, found cosmological evidence to suggest that God intervenes periodically to readjust the orbits the planets. In the nineteenth century, Darwin sparked a new image of God as designer. God became the designer of the natural laws and the process of evolution, not the designer of each individual creature as it enters the world.

Today, there are many tenets to the doctrine of intelligent design. Former professor of law Phillip Johnson was one of the first driving forces behind the intelligent design movement. He likened his strategy of creating public awareness to the process of a wedge splitting a log. With just a small opening, he could increase public awareness and receptivity toward notions of the supernatural in science. For Johnson, the intelligent design movement "starts with the recognition that 'In the beginning was the Word,' and 'In the beginning God created.'"⁹⁰ Johnson's interpretation of intelligent design is a particularly theistic one, especially when compared to the interpretations of Descartes and Newton. For biochemist Michael Behe, there is evidence for intelligent design in the biochemistry of life. Behe coined the phrase "irreducible complexity" to refer to biochemical processes that, in his opinion, could not possibly have evolved according to Darwinian evolution. If we could shrink ourselves down to the molecular level and observe the inner workings of an intact cell, we would find complex, mechanical systems that require many molecules working unison like a machine. Behe argues that such systems could never have evolved in the Darwinian sense as they

⁹⁰ *Creation, Evolution, & Modern Science: Probing the Headlines that Impact Your Family* edited by Ray Bohlin with foreword by Phillip E. Johnson (Grand Rapids, MI: Kregel Publications, 2000), p. 5.

require all the pieces to be in place from the very beginning. Therefore, these systems must be the result of intelligent design. Mathematician and theologian William Dembski bases his belief in intelligent design on the notion of “specified complexity,” a term popularized by him. We can understand specified complexity via the following analogy: “A single letter of the alphabet is specified without being complex. A long sentence of random letters is complex without being specified. A Shakespearean sonnet is both complex and specified.”⁹¹ For Dembski, there is too much order in life on earth to be the result of sheer chance. Order is given to something by an agent of higher intelligence, be that intelligence Shakespeare or God.

Behe’s irreducible complexity, and Dembski’s specified complexity are examples of how people make the movement from nature to God in natural theology. However, the idea of the *Anthropic Principle* is perhaps the most compelling evidence in favor of natural theology and intelligent design. The anthropic principle refers to a peculiar pattern in the numbers that hold our most fundamental physics equations together. These mathematical constants indicate a universe finely-tuned to support the existence of life. In fact, life as we know it would be impossible without this seemingly arbitrary set of physical constants. The astronomer Martin Rees points to six numbers in his book *Just Six Numbers* which are not only “especially significant,” but are vital to the sustenance of the universe.⁹²

N = the ratio of the strength of electromagnetism and the strength of gravity.
 ϵ = the strength of the force between protons and neutrons.
 Ω = the measure of the amount of material in our universe.
 λ = the strength of ‘antigravity’ which controls the expansion of the universe.

⁹¹ William Dembski, *Intelligent Design: The Bridge Between Science & Theology* (Downers Grove, IL: InterVarsity Press, 1999), p. 47.

⁹² Martin Rees, *Just Six Numbers: The Deep Forces that Shape the Universe* (New York, NY: Basic Books Publishing, 2000), p. 2-3.

Q = the ratio between the gravity holding a galaxy together and the mass of that galaxy.

D = the number of spatial dimensions in space-time.

The values of these numbers are of little importance to our purposes; they involve numbers too small and too large for comprehension, yet they are essential for life and the universe as we know it. The American physicist John Wheeler said, “It is not only that man is adapted to the universe. The universe is adapted to man. Imagine a universe in which one or another of the fundamental dimensionless constants of physics is altered by a few percent one way or the other? Man could never come into being in such a universe.”⁹³ Stephen Hawking condenses the idea of the anthropic principle to “We see the universe the way it is because we exist.”⁹⁴

For more on the anthropic principle, let us turn to Hugh Ross, an astrophysicist and old-earth creationist who has published more than a dozen books on the topic of science and Christianity. Ross falls in line with natural theology for his belief that there is scientific evidence that God created the universe with humanity in mind. For Ross, the anthropic principle is compelling evidence of a Creator, “... if the matter and energy [of the universe] are finite in extent and in time, and if the ranges of the parameters for life are narrow, we have potent evidence for a personal Creator, specifically for the God of the Bible.”⁹⁵ In his book *The Creator and the Cosmos*, Ross presents thirty “scientific evidences for a big bang creationist event as described in the Bible.”⁹⁶

⁹³ John Barrow and Frank Tipler, *The Anthropic Cosmological Principle* with foreword by John Wheeler (New York, NY: Oxford University of Press, 1988), p. vii.

⁹⁴ Stephen Hawking, *A Brief History of Time: From the Big Bang to Black Holes* (London, England: Bantam Books, 1988), p.137.

⁹⁵ Hugh Ross, *The Fingerprint of God: Recent Scientific Discoveries Reveal the Unmistakable Identity of the Creator*, revised edition (New Kensington, PA: Whitaker House, 2000), p. 4.

⁹⁶ Hugh Ross, *The Creator and the Cosmos: How the Latest Scientific Discoveries of the Century Reveal God*, enlarged 3rd edition (Colorado Springs, CO: NavPress Publishing Group, 2001), p. 221-227.

However, these thirty “scientific evidences” are no more than scientific facts which Ross has superimposed on a Christian backdrop. For example, Ross points to the cosmic microwave background leftover from the Big Bang, and the fact that “astronomers actually witness the universe getting hotter and hotter as they look back in time” as evidence for God. But these statements would be true whether or not a Christian God preceded and caused the universe’s existence. There is nothing about these scientific facts in themselves that implies the God of the Bible.

While the scientific community is in general agreement that the physical constants of the universe are peculiarly optimal for the evolution of life, there remains little agreement as to why the physical constants have the values they have. God may be responsible for the physical constants, but did he intentionally pick a set that would yield life? There are two prevailing scientific explanations for the seemingly arbitrary values of the physical constants, one is the “many-worlds” or “multiverse” hypothesis and the other is the “oscillating universe” hypothesis. With the former, our universe has one set of physical constants, but there are other universes existing simultaneously, each with their own unique sets of physical constants that are completely different from ours. With the latter, there is only one universe that expands, collapses in on itself, and then re-expands in an oscillating cycle, and the physical constants vary from re-expansion to re-expansion. It follows that God could be at the beginning of either the many-worlds hypothesis or the oscillating universe hypothesis, which is a testament to the versatility and applicability of natural theology.

In summary, there are many scientific avenues to theology. For some, it is the complex biochemistry of life. For others, it is the peculiar pattern of the physical

constants that satisfy the mathematics of the universe. Biochemist and advocate of intelligent design Michael Denton pulls these ideas together:

... the eerie illumination of science penetrates evermore deeply into the order of nature, the cosmos appears increasingly to be a vast system finely tuned to generate life and organisms of biology very similar, perhaps identical, to ourselves. All the evidence available in the biological sciences supports the core proposition of traditional natural theology - that the cosmos is a specially designed whole with life and mankind as a fundamental goal and purpose, a whole in which all facets of reality, from the size of galaxies to the thermal capacity of water, have their meaning and explanation in this central fact.⁹⁷

All scientific evidence aside, some people support the notion of intelligent design simply because it “makes sense.” D’Souza, who we saw in the *Dialogue* category, believes intelligent design is simply the best explanation of reality. He writes, “It is more than absurd to posit that the universe caused itself. The most reasonable explanation is that our rational universe is the product of some super-rational or omniscient intelligence. An intelligent designer is not the only explanation, but it is certainly the best explanation.”⁹⁸

The intelligent design movement is closely tied to the debate between deism and theism. Even if God is the original designer of the universe, this does not mean he revealed his methods and purposes as the Bible contends. The philosopher John Leslie, in his book *Universes*, articulates this distinction. Either God started the universe off “with this or that many particles in this or that arrangement” (deism), or “he makes the universe obey a particular set of laws” while “sustaining” and “recreating” it from

⁹⁷ Michael Denton, *Nature’s Destiny: How the Laws of Biology Reveal Purpose in the Universe* (New York, NY: The Free Press, 1998), p. 389.

⁹⁸ Dinesh D’Souza, “The Failure of ‘Intelligent Design’,” published April 7, 2008, a web based publication of Townhall.com, accessed January 12, 2014.

“moment to moment” according to his revelation (theism).⁹⁹ Arthur Peacocke, who we will address shortly, develops the notion of God as Designer and Sustainer in his theology of nature. The question between deism and theism is an important one, as it may be only a small step from deism to atheism if we push God back to the First Cause of Aristotle and Aquinas, or the watchmaker of Descartes.

Whether or not the scientific evidence does indeed point to an intelligent designer, there are many who find the notion difficult to stomach. Scientific historian and founder of “The Skeptics Society,” Michael Shermer, writes, “Which is more likely? That the universe was designed just for us, or that we see the universe as having been designed just for us?”¹⁰⁰ Astrophysicist Neil deGrasse Tyson believes intelligent design leads only to intellectual stagnation and complacency. He says embracing ignorance is “fundamental to the philosophy of intelligent design,” and he argues that the frontiers of science will never be expanded by those who believe a higher intelligence is responsible for our intelligence.¹⁰¹ For Richard Dawkins, Darwin’s theory of evolution “shatters the illusion of design within the domain of biology.”¹⁰² Clearly, the jury is still out on intelligent design, at least some of the scientific jurors remain unconvinced.

Arguments for natural theology and intelligent design have some legs.

Irreducible complexity, specific complexity, the anthropic principle, and the direction of evolution all suggest that this universe was meant to produce human beings. However,

⁹⁹ John Leslie, *Universes* (New York, NY: Routledge, 1996), p. 2.

¹⁰⁰ Michael Shermer, *Why Darwin Matters: The Case Against Intelligent Design* (New York, NY: An Owl Book of Henry Holt and Company, LLC publishing, 2006), p. 59.

¹⁰¹ Neil deGrasse Tyson, *Death by Black Hole: And Other Cosmic Quandaries* (New York, NY: W. W. Norton & Company, Inc., 2007), p. 361.

¹⁰² Dawkins, *The God Delusion*, 143.

intelligent design requires careful articulation in Christian circles in order to avoid the trap of deism for this is not the God of the Bible. Barbour argues that because natural theology begins with “scientific data on which we might expect agreement despite cultural and religious differences,” it is an attractive option in this time of religious pluralism. Attractive as it may be, natural theology is a lackluster Christian movement in the sense that nature’s orderliness rarely inspires serious religious beliefs capable of transforming lives. It is Barbour’s hope that intelligent design may overcome some of the obstacles we saw in the *Conflict* category by “showing that the idea of a Designer is as reasonable as alternative interpretive proposals.”¹⁰³ But the fact of the matter is that scientific knowledge is built on evidence, and this evidence does not definitively point to or away from God. The anthropic principle makes it seem as if human existence is the goal of the universe but this is not certain. Ultimately, the matter remains in the realm of personal opinion.

Theologies of nature, as the name suggests, are not much different from natural theologies. The overall structure is the same - a God above that is ultimately responsible for the universe and life that science seeks to know - but while natural theologies reach this conclusion through scientific evidence and knowledge, theologies of nature approach it from the perspective of the Bible and the Christian tradition. Barbour writes, “Here, science and religion are considered to be relatively independent sources of ideas ... but the doctrines of creation, providence, and human nature are effected by the findings of science.”¹⁰⁴ Many of the truths of science are undeniable, therefore it is

¹⁰³ Barbour, *Religion and Science*, 100.

¹⁰⁴ *Ibid.*, 100.

prudent and necessary to seek a consistency between Christian doctrine and scientific knowledge. Theologies of nature strive for this consistency.

For an example of a theology of nature, we need look no farther than the writings of Jesuit priest Pierre Teilhard de Chardin. Teilhard draws both from his expert knowledge of paleontology and geology, and his preexisting faith in God to integrate science and Christianity in a new scheme. He affirms the scientific truth of cosmic evolution, “the evolution of matter, in current theory, comes back to the gradual building up by growing complication of the various elements recognized by physical chemistry.”¹⁰⁵ According to Teilhard, there is a grand evolutionary story at work: from the cosmic dust of the early atmosphere, to the formation of inanimate objects like planets and stars (the “geosphere”), to the layer of life covering the earth (the “biosphere”), this evolution is heading towards a “crowning noosphere.”¹⁰⁶ The “noosphere” is the sphere of human intellect which emerged from the biosphere via the development of human cognition, and it is ultimately progressing towards “hyperpersonal organization” in the “Omega Point.” The “Omega Point” is Teilhard’s term for the highest possible level of complexity and consciousness that life, and the universe can achieve.¹⁰⁷ At the center of this scheme is a personal, provident, and loving God who is “communicating himself to man on the level of and through the ways of intelligence.”¹⁰⁸ In other words, God rigged the system of nature so that the universe and life would progress inevitably toward the Omega Point. For Teilhard, Christ purifies, directs, and superanimates the “general ascent of consciousness into which

¹⁰⁵ Teilhard de Chardin, Pierre. *The Phenomenon of Man* (New York: HarperCollins Publishers Inc., 1975), 47.

¹⁰⁶ *Ibid.*, 184.

¹⁰⁷ *Ibid.*, 13.

¹⁰⁸ *Ibid.*, 293.

[God] inserted himself.”¹⁰⁹ Barbour notes that while Teilhard’s scheme seems to move from science to theology like a natural theology, Teilhard’s ideology is actually deeply rooted in his religious upbringing. It is as if Christianity is the block of marble and science the chisel which carves the marble. Christianity is the constant, the unaltered, and science is simply a transforming agent. Teilhard’s fusion of scientific knowledge with Christian tradition yields a robust theology of nature that exemplifies the *Integration* approach to science and Christianity.

In his book *Theology for a Scientific Age*, biochemist and theologian Arthur Peacocke aims to “work out a theology which is both rooted in the Judeo-Christian tradition and also consonant and coherent with those scientific perspectives on the world which are well-established enough in our culture to form the pre-suppositions of most of our thinking, at least in the ‘West.’”¹¹⁰ For Peacocke, God is not exempt from the rules of logic used by science: “theology, like any other human inquiry into the nature of reality, must use the same general criteria of reasonableness as, say, science itself.”¹¹¹ Many critics have called Peacocke’s worldview a version of panentheism. In panentheism, God is at the same time in every piece of nature and eternally removed from all of nature. Panentheism offers a nice introduction, but, as we are about to see, Peacocke’s complex theology of nature moves past this general belief system.

Subjecting Christian doctrine to scientific knowledge, for Peacocke, yields a God that is transcendent and immanent, a God that is the “Ground of all Being” and the “Ground of all Becoming.” Here, “Being” is a reference to what there is, while

¹⁰⁹ Ibid., 294.

¹¹⁰ Arthur Peacocke, *Theology for a Scientific Age: Being and Becoming – Natural, Divine, and Human* (Minneapolis, MN: Fortress Press, 1993), 336.

¹¹¹ Ibid., 91.

“Becoming” is a reference to what is going on. Peacocke writes, “God’s being is the source of all other existents. God is Being itself.”¹¹² An “existent,” for which God is ultimately responsible, is any entity of matter or energy, or the structures they collectively create, like atoms, humans, and galaxies. But these entities endure without God’s direct intervention; they are free to evolve via a mechanism that is open-ended and allows for novel emergences of existence. God is transcendent in that “God is the one who ‘lets-be’ and who is totally distinct from, over against, all-that-is.”¹¹³ But as novelty unfolds within a particular existent, this is effectively an emergence of novelty in the Being of God, therefore God is perpetually and dynamically Becoming. God as the Ground of all Becoming “continually interacts with that which becomes in the created order,” such that he exists in every piece of nature at all times. Hence, God as immanent.¹¹⁴ In summation, God is present “to, in, with, under and through all natural events.”¹¹⁵ For Peacocke, we need both science and Christianity to understand the universe and our role in it. Neither ideology tells the entire story on its own.

Barbour points to several prominent issues with which any theology of nature must contend, including those of Teilhard and Peacocke. The age-old obstacle of reconciling “omnipotence and omniscience with human freedom and the existence of evil and suffering” has confronted, and continues to confront philosophers, scientists, theologians, and religious individuals alike.¹¹⁶ The role of chance complicates matters further as we try to represent God’s action in the universe. The distinction between primary and secondary causes preserves the partnership between scientific knowledge

¹¹² Ibid., 185.

¹¹³ Ibid., 185.

¹¹⁴ Ibid., 185.

¹¹⁵ Ibid., 23.

¹¹⁶ Barbour, *Religion and Science*, 102.

and traditional Christian theology. But what becomes of God upon designing the secondary causes? Does God back away completely, leaving human beings to make their own decisions? Did God preprogram the fate of all things in the primary action of creation such that all our lives are pre-determined? Or, is God responsible for every event of the universe in real time, constantly active and intervening?

In addition to these questions, theologies of nature, Barbour notes, must also contend with questions surrounding environmental ethics. Many environmental activists blame the Bible for perpetuating notions of human dominion over non-human nature that lead to unreserved environmental destruction. It is only in recent decades (the past fifty or sixty years) that science has demonstrated just how detrimental modern civilization is to the delicate ecosystem that is our planet. For example, according to Australian biologist Robert May, if we plot the rate at which new species emerge in the world “as the y-axis on a graph 10 cm high, then on the same scale extinction rates would require an x-axis extending 100 km.”¹¹⁷ Barbour, however, illuminates several “biblical themes that give strong support to environmentalism.” He points to themes of “stewardship” and “celebration” of nature, as well as the presence of the Holy Spirit in nature.¹¹⁸ Sure, there are many verses in the Bible that inspire humans to care for the earth, but there are also verses like Genesis 1:26 or 1:28 that, depending on one’s interpretation, suggest that nature is subject to the will of human beings. The fact of the matter is that people of all belief systems must direct concern and effort towards sustaining the environment. Although Barbour means well in pointing to themes of

¹¹⁷ Robert May, “How Many Species are There on Earth?” *Science*, **241** (4872), September 16, 1988, p. 1448.

¹¹⁸ Barbour, *Religion and Science*, 102-103.

environmental concern in the Bible, the issue is much larger than he posits. No creed can stand in the way of protecting our fellow creatures and planet.

The final approach of the *Integration* category is the systematic synthesis of science and Christianity in *process philosophy*. Throughout this work, we have traced a general convergence of scientific and Christian thought. Beginning with the opposing ideologies of scientific materialism, atheism and secularism on the one hand, and biblical literalism and creationism on the other, and ending here with process philosophy, where both worldviews make contributions to one comprehensive metaphysics. Process philosophy is the most “promising candidate for a mediating role today” between science and Christianity, Barbour argues, because it was born “under the influence of both scientific and religious thought.”¹¹⁹

English mathematician and philosopher Alfred North Whitehead is widely considered “the father of process thought,” and his 1929 book *Process and Reality* is the foundational text of the philosophy. Whitehead was born in 1861, just two years after Darwin published *On the Origin of Species* containing his theory of evolution. Science and technology flourished during Whitehead’s life time, perhaps even more so than today. Whitehead’s life coincides almost directly with the maturation of modern science in the great discoveries of electromagnetism, relativity, quantum physics, and Darwinian evolution. Furthermore, Christianity was undergoing a refinement of its own during this period. Early in the nineteenth century, Bible scholars like Johann Gottfried Eichhorn and Wilhelm Martin Leberecht De Wette posited that the Bible was not divinely revealed but written by fallible human beings. It is no wonder that Whitehead

¹¹⁹ Ibid., 104.

sought a metaphysical grounding amidst this hurricane of human understanding.

Whitehead looked to history's greatest scientific and philosophical minds to devise his metaphysics; the influences of Plato, Aristotle, Aquinas, Descartes, Newton, Spinoza, Locke, Leibniz, Hume, Kant, Darwin and Einstein are clear. Whitehead sought a "coherent, logical, applicable and adequate" philosophical scheme in which "everything of which we are conscious, as enjoyed, perceived, willed, or thought, shall have the character of a particular instance of the general scheme."¹²⁰ Process philosophy is this scheme.

The most natural starting point for delineating Whitehead's process philosophy is the concept of an "actual entity." According to Whitehead, actual entities "are the final real things of which the world is made up. There is no going behind actual entities to find anything more real... God is an actual entity, and so is the most trivial puff of existence in far-off empty space... actual entities are drops of experience, complex and interdependent."¹²¹ Another term for an "actual entity" is an "actual occasion" which reflects the temporal aspect of existence. For Whitehead, actual entities are individual events of being in time. These individual events emerge from the past, become in the present, and then conclude in a perpetual procession whereby past events inform subsequent events of becoming to create the slow march of time. The present is consequently the culmination of all relevant past events into a novel instant of being which arrives, ceases, and then becomes a datum for the emergence of the next present moment.

¹²⁰ Alfred North Whitehead, *Process and Reality*, corrected edition, edited by David Griffin and Donald Sherburne (New York, NY: The Free Press, 1985), p. 3.

¹²¹ *Ibid.*, 18.

The emergent act of an actual entity into the present is the act of “concrecence.” The concrecent moment for an actual entity is informed by past actual entities by the process of “prehending” or feeling. Whitehead writes, “... the first analysis of an actual entity, into its most concrete elements, discloses it to be a concrecence of prehensions, which have originated in its process of becoming.”¹²² According to Whitehead, there are three components to every prehension: the “prehending subject”, which is an actual entity, the “datum” being preheded, and the “subjective form,” which is how the subject prehends the datum.¹²³ The process of passing from the “objectivity of the data to the subjectivity of the actual entity is the feeling of prehension.”¹²⁴ Whitehead’s concept of subjective form bears much resemblance to Plato’s forms. The subjective form refers not to the constituent matter of an object, but to the object as a whole. For example, the subjective form of a cheetah is not the atoms and molecules that make up the cheetah, but the general shape, nature, and purpose that define the cheetah. The subjective form is preceded and determined by the subjective aim, which is how, in the process of self-creation, a subject feels “a proposition with the subjective form of purpose.”¹²⁵ It is via the subjective aim that the subjective form is realized, and the subjective aim is a direct derivative of God’s nature.¹²⁶

Whitehead describes three primary characteristics of the God of process theology: (1) the “primordial nature” of God which is the “concrecence of a unity of

¹²² Ibid., 23.

¹²³ Ibid., 23.

¹²⁴ Ivor Leclerc, *Whitehead’s Metaphysics: An Introductory Exposition* (Ontario, Canada: Fitzhenry & Whiteside Limited, 1975), p. 154.

¹²⁵ Whitehead, *Process and Reality*, 25.

¹²⁶ Ibid., 67.

conceptual feelings, including among their data all eternal objects.” (2) The “consequent nature” of God which is the “physical prehension by God of the actualities of the evolving universe.” (3) The “superjective nature” of God which is the “character of the pragmatic value of his specific satisfaction qualifying the transcendent creativity in the various temporal instances.”¹²⁷ Let’s look first at God’s “primordial nature”. Seeing as God is an actual entity, he prehends other actual entities which inform his relevant future; every actual entity in the universe factors in to God’s concrescence. In this way God is primordial by being “with all creation” rather than “before all creation.” Since God supplies every actual entity with its initial subjective aim, as Barbour notes, “God envisages the potential forms of relationships that are not chaotic but orderly, even before they are realized.”¹²⁸ It is almost as if the universe is the mind of God, the order and events of which become real upon their conception. Whitehead writes, God “is the unconditioned actuality of conceptual feeling at the base of things; so that, by reason of this primordial actuality, there is an order in the relevance of eternal objects to the process of creation.”¹²⁹

The second dimension is the “consequent nature” of God. This means that the events of the universe have an effect on God; “He shares with every new creation its actual world; and the concrescent creature is objectified in God as a novel element in God’s objectification of that actual world.”¹³⁰ It is the subjective aim, conceptualized and bestowed by God, which directs this prehension into God. In other words, the actual entities of the universe not only influence one another, they also influence God. And if

¹²⁷ Ibid., 87-88.

¹²⁸ Barbour, *Religion and Science*, 293.

¹²⁹ Whitehead, *Process and Reality*, 344.

¹³⁰ Ibid., 345.

God is susceptible to the actual entities of the universe then there is an aspect of reality that is left undetermined, fluid, and free. Here, we see God as the ground of all novelty, as Barbour writes, “God elicits the self-creation of individual entities and thus allows for freedom as well as structure and directionality.”¹³¹ The relationship between God and the universe is reciprocal. Whitehead frequently referred to process philosophy as the “philosophy of organism,” and it is clear that God and the universe are ecologically related. They are two pieces of a larger whole that is reality.

The third and final dimension is the “superjective nature” of God. In process philosophy, the “subject” is an existing actual entity, while the “superject” is that same actual entity as it belongs to the nature of every other entity in their potentials for becoming. According to Whitehead, a superject is the “atomic creature exercising its function of objective immortality.”¹³² Upon the concrescence and perishing of an actual entity, the subject becomes the object effecting the becoming of future entities, this is the superject. Whitehead writes, “The subject emerges from the world – a ‘superject’ rather than a ‘subject’.”¹³³ The consequent nature of God describes how God perceives the universe, while the superjective nature of God describes how God is perceived by the universe. As a superject, God is immortal, and he influences every temporal instant. God perceives and adjusts to the universe via his consequent nature, which means immortal influence of his superjective nature is subject to change as novel emergences feeds into his prehension and concrescence. In process philosophy, God is the process.

Whitehead provides a final summary of God’s nature in a group of six antitheses and paradoxes.

¹³¹ Barbour, *Religion and Science* 293.

¹³² Whitehead, *Process and Reality*, 45.

¹³³ *Ibid.*, 88.

1. It is as true to say that God is permanent and the World fluent, as that the World is permanent and God is fluent.
2. It is as true to say that God is one and the World many, as that the World is one and God many.
3. It is as true to say that, in comparison with the World, God is actual eminently, as that, in comparison with God, the World is actual eminently.
4. It is as true to say that the World is immanent in God, as that God is immanent in the World.
5. It is as true to say that God transcends the World, as that World transcends God.
6. It is as true to say that God creates the World, as that the World creates God.¹³⁴

Perhaps it is only in the ambiguity of these antitheses that God can survive on a diet of scientific and Christian doctrine. Unfortunately, and I think this is probably not a coincidence, there are very few practical examples to be found in Whitehead's work. The systematic synthesis of science and Christianity that is process thought hardly offers the comforts of the traditional Christian religion. Furthermore, there are few, if any, practical applications for process thought in our daily lives. While Barbour's claim may be true that process philosophy is the "most promising metaphysical system in which evolution and continuing creation can be integrated," it does not mean process philosophy fills the same role in our lives that is filled by Christianity or the other religions of old.¹³⁵

The approaches of the *Integration* thesis undeniably overcome the image of conflict between science and Christianity. Independently, science and Christianity capture many fundamental truths about the universe and about the human experience, and the approaches we have just seen attempt to extract and fuse these truths. The doctrine of intelligent design allows the individual to acknowledge the truth of science

¹³⁴ Ibid., 348.

¹³⁵ Ibid., 249.

in light of the greater Christian story. Seemingly everywhere in nature science finds organisms and systems that appear to be designed. For the advocate of intelligent design, these organisms and systems are designed by a higher intelligence, sometimes taken to be the God of Christianity. Behe's irreducible complexity, Dembski's specified complexity, and the anthropic principle are all examples of how science implies theology. In Teilhard's and Peacocke's theology of nature, we start with Christian doctrine and make adjustments in accordance with scientific knowledge. Rather than understanding Christianity in terms of a literal reading of the Bible, Teilhard and Peacocke reformulate the Christian message. For Teilhard, God is the highest possible good and love, and all of creation is moving towards this ideal of consciousness and complexity. For Peacocke, God designed the process of evolution and intended for it to produce human beings who are capable of embodying God's attributes and characteristics. Death and evil are necessary and inevitable, but God suffers along with his creation as his existence is tied to creation. Whitehead's process philosophy integrates science and Christianity at an even more fundamental level in that Christian ideals are actually built into the fabric of space and time as God seeks the actualization of the greater good in every temporal process. The worldviews of the *Integration* thesis, as innovative and ingenious as they may be, are not without their problems. Most notably, and we will elaborate on this point later, they seem to have little grounding in the Bible which is the cornerstone of the Christian religion.

VI. Conclusion

The time has come to look closely at Barbour's personal position on the relationship between science and Christianity, and make some final points on the topic. Does Barbour take the side of the scientific materialist or the biblical literalist, who envision only conflict and struggle between science and Christianity? Does he believe the avenue to reconciliation lies in separating science and Christianity into non-overlapping realms like the neo-orthodox Christian, the existentialist, the linguistic analyst, or the advocate of Gould's NOMA? Perhaps Barbour believes we should aim for some form of dialogue where science and Christianity relate via limit questions, methodological parallels, or via the religious dimensions of science. Or, does Barbour endorse an idea of the *Integration* variety like intelligent design, theology of nature, or process philosophy? One goal of this section is to shed light on Barbour's personal beliefs regarding the relationship between science and Christianity, but a second goal is to understand this relationship from a fresh perspective. Ultimately, we will find that theologians fail to provide adequate grounds for theological commitment in the face of scientific findings, but, at the same time, scientists have not eliminated the possibility that God exists. Furthermore, there remains a significant gulf between the practical theologies embraced by everyday Christians, those centered on Christ and the Bible, and the sophisticated theories that attempt to unite Christian theology and modern science.

Let us begin with the approaches of the *Conflict* thesis where science and Christianity are competing worldviews. In Barbour's opinion, this image of conflict is an illusion, or a "false dilemma." The real problem is not that science and Christianity

are inherently antagonistic, the real problem, for Barbour, is that both scientific materialists and biblical literalists “err in assuming that evolutionary theory is inherently atheistic.”¹³⁶ Barbour is correct on this point. The theory of evolution does not rule out the existence of God. In fact, many people, as we have already seen, believe God created the process of evolution. However, if the theory of evolution is true, then biblical creationism cannot be true. This means that there is a victor and a loser when it comes to the contest between scientific materialism and biblical literalism on the topic of the development of life. Ultimately, the identity of the victor depends on personal preference; either one acknowledges and accepts the body of scientific knowledge pointing to the truth of evolution, or one believes in the literal account of the Bible in spite of the scientific evidence.

For Barbour, the problematic assumption that evolution is atheistic comes from “the shortcomings of a fragmented and specialized higher education system.” On this point, we find ourselves in cautious agreement with Barbour. Universities around the world strive to educate their students on a broad range of topics, but at some point all students are pigeon-holed into a specific field. We have no words to rival Barbour’s phrasing of the problem, “The training of scientists seldom includes any exposure to the history and philosophy of science or any reflection on the relation of science to society, to ethics, or to religious thought. On the other hand, the clergy has little familiarity with science and is hesitant to discuss controversial subjects in the pulpit.”¹³⁷ This being said, there is a case to be made for the academic versatility of many scientists in spite of Barbour’s stance. Throughout the academic career of a scientist, he or she is necessarily

¹³⁶ Barbour, *Religion and Science*, 84.

¹³⁷ *Ibid.*, 84.

exposed to a variety of disciplines like sociology, history, philosophy, and linguistics. But the academic career of a historian, for example, often does not include lessons on electromagnetism or the process of DNA replication. It is possible that the ignorance Barbour believes is behind the false dilemma of the *Conflict* thesis is more one-sided than he recognizes. Whether or not the system of formalized education does the student a disservice by dividing life into narrow subjects, all areas of study are important and interrelated, and we must bring more attention and emphasis to this fact, especially early in one's schooling.

One problem with Barbour's analysis of the *Conflict* thesis is that upon peeling away the layers to look directly at the compatibility of science and Christianity, we miss many indirect instances of conflict. Politics, for example, is a major arena in which these ideologies come into conflict that is not immediately apparent via doctrinal analysis. Scientific materialists and biblical literalists tend to line-up on opposite sides of controversial topics like stem-cell research, abortion, homosexuality, and climate change. The conflict between science and Christianity is firmly rooted in history, but are we ruining the future by clinging too firmly to the past? Perhaps it is time to look past particular ideologies and design legislation that benefits the global ecosystem. At the very least, scientific materialists and biblical literalists must find enough respect for each other's beliefs to coexist without interfering in the lives of others.

With respect to the *Independence* thesis, Barbour believes the approaches thereof are "a good starting point or first approximation."¹³⁸ Barbour rightly emphasizes the importance of preserving the distinctive character of each ideology. Science and

¹³⁸ Ibid., 88.

Christianity are woven into the fabric of human life and each captures a fundamental truth about reality. In Barbour's opinion, neo-orthodox Christianity "rightly stresses the centrality of Christ and the prominence of scripture in the Christian tradition."¹³⁹ There is no denying the role of scripture in the Christian tradition. Christianity is grounded in the Bible which tells, among other stories, the story of the life and death of Christ. While it may be true that neo-orthodoxy stresses these ideas, this stress does not in any way confirm the truth of these ideas. Here, we catch our first glimpse of Barbour's bias. Barbour is first and foremost a Christian, and this fact shades his position on the relationship between science and Christianity.

With respect to existentialism, Barbour believes it "rightly puts personal commitment at the center of religious faith, but it ends by privatizing and interiorizing religion to the neglect of its communal aspects."¹⁴⁰ Christian faith does indeed depend on personal commitment. Only the individual, not the community, is capable of making Kierkegaard's leap of faith and accepting God into his or her heart. It is also true that Christianity offers a sense of camaraderie, but this does not make the ideologies uniting the Christian community fruitful to humanity as a whole. Barbour notes that if "God acts exclusively in the realm of selfhood," then nature is "devoid of religious significance." Technically, this observation is correct, but few, if any, people would argue that God is independent of nature. Nature has been one of the chief motivators of religious feelings for millennia. If God exists, then he almost certainly has investments in nature, and the existentialist distinction fails.

¹³⁹ Ibid., 88.

¹⁴⁰ Ibid., 89.

The distinction between science and Christianity upheld by linguistic analysts, for Barbour, “has helped us to see the diversity of functions of religious language,” but “we cannot remain content with a plurality of unrelated languages.” Interpreting science and Christianity as languages or ways of life certainly eases tensions between these communities and helps with the delineation of similarities and differences, but, as Barbour notes, a “plurality of unrelated languages” offers no hope of uniting the scientific and Christian communities. Instead, Barbour advocates a “pluralistic dialogue,” which he believes “offers the greatest prospect for religious cooperation in a global age.”¹⁴¹ We can view science and Christianity as different languages, but, in the end, they must collaborate on some level if each are to survive. Gould’s non-overlapping magisteria falls into the same trap as the approach of the linguistic analyst. With NOMA, science and Christianity occupy separate magisteria, but this scheme does not encourage cooperation on any level, and it errs in assigning nature to the jurisdiction of science, rather than the jurisdiction of Christianity.

Herein lies Barbour’s chief complaint concerning the ideologies of the *Independence* thesis, “If science and religion were totally independent, the possibility of conflict would be avoided, but the possibility of constructive dialogue and mutual enrichment would also be ruled out.”¹⁴² Forcing science and Christianity into separate corners is not going to promote cooperation going forward, it will only delay the inevitable conflict. But the most blaring problem with the separatist approaches of the *Independence* category, and Barbour does not discuss this problem, is that all of these approaches assign nature to the domain of science as if Christianity has nothing of

¹⁴¹ Ibid., 161.

¹⁴² Ibid., 89.

importance to say about nature. Before the maturation of modern science, Christian doctrine was a primary source of knowledge about nature. If the jurisdiction of Christianity does not include nature, as the ideologies of the *Independence* thesis contend, then these ideologies ignore God's role as Creator as described in the Bible. It seems that in the urge to avoid conflict between science and Christianity, the *Independence* model highlights areas of difference while ignoring important areas of overlap altogether. Barbour rightly realizes that this approach offers no long-term solutions to reconciling science and Christianity.

If there is one thing to be learned from the approaches of the *Dialogue* category, it is that there are no answers in absolutism. Science and Christianity, like so many other areas of human life, cannot be reduced to black and white distinctions. The central dogma of the *Dialogue* category is that science is true, but it does not describe the entire picture of reality, for that, we need Christianity, or at least Christian theology. Calling upon Christianity when science encounters its natural limits is an effective strategy for avoiding conflict and promoting cooperation. D'Souza turns to Christianity in part because it provides answers to questions that science cannot answer, like why are we here, what initiated the Big Bang, and what happens to us when we die? As we saw earlier, Drummond famously termed this approach the "God-of-the-Gaps." But Barbour realizes the flaws of this approach as the "God-of-the-Gaps has been a losing proposition, as one gap after another [is] filled by new scientific advances."¹⁴³ Placing Christianity at the ends of scientific knowledge is only a temporary solution to bridge the gap between these ideologies. It is easy to find the truth in Barbour's remark that "if

¹⁴³ Ibid., 296.

the points of contact between science and theology refer only to the basic presuppositions and limit questions, reformulation will seldom be called for.”¹⁴⁴

Fortunately, the ideologies of the *Integration* thesis find more substantial ways of reconciling science and Christianity.

The idea that there are similarities in the methods of science and Christianity is a promising avenue toward peace and cooperation. We saw with Kuhn how both ideologies depend on paradigms that are subject to the flux of popular opinion. The relationship between the scientist and his or her experiment is another methodological parallel between science and Christianity, but one that is not yet fully understood. The fact that in some cases the act of observation actually effects what is observed is truly peculiar. On this topic, Barbour writes, “In accordance with critical realism and the later views of Bohr and Heisenberg, I have interpreted the Uncertainty Principle as an indication of objective indeterminacy in nature rather than the result of subjective uncertainty and human ignorance.”¹⁴⁵ In other words, Barbour believes there are aspects of nature that will never be fully understood. Until the scientific enterprise fully understands the relationship between ourselves and nature, we cannot speculate as to how Christianity, and religion in general, is affected by these findings. In this way, as Barbour noted, the “consideration of methodology” is only a “preliminary task” in reconciling science and Christianity.”¹⁴⁶

Nature-centered spiritualities rightly draw attention to the importance of nature in the human experience. Nature is our home. Nature sustains us. Nature inspires us. We are nature. All humans have this in common, and this is why many advocates of this

¹⁴⁴ Ibid., 92.

¹⁴⁵ Ibid., 193.

¹⁴⁶ Ibid., 95.

worldview, like Swimme and Berry, call for universal ideologies that protect humanity as a whole. The only idea Barbour extracts from these spiritualities is that “theology should incorporate both divine immanence in nature and transcendence of nature.”¹⁴⁷ But what if nature is all there is? What if nothing transcends nature? If this materialist perspective is true, and there is no such thing as the “supernatural,” then Christianity has a whole new set of problems.

The universal, science-based myth called for by Swimme and Berry, becomes even more appealing upon considering the spiritual dimension of science. Many scientists have expressed awe and reverence at the scientific story of the cosmos. Some have even gone as far as to suggest that the religious feelings aroused by science are more authentic than the religious feelings aroused by the religions of the world. Einstein certainly felt this way. He believed science filters religion of its anthropocentric impurities, leaving religion as it was meant to be in the filtrate. The scientific narrative of reality is a beautiful story that inspires awe and reverence around every corner. Perhaps this profound scientific narrative should be the basis of a new cosmic ideology, one that values humanity, animals, nature, and the planet. Perhaps many Christian ideals would find their way into such an ideology. It is possible that Barbour’s Christian affiliation bars him from realizing and appreciating the potential of the religiosity of science. These approaches of the *Dialogue* thesis that bring science and Christianity together are undeniably more progressive than the approaches of the *Conflict* thesis, as well as more constructive than the separatist ideologies of the *Independent* thesis. But

¹⁴⁷ Ibid., 97.

they do not offer a solution that both scientific and Christian communities can agree on. Such solutions are the focus of the *Integration* thesis.

The approaches of the *Integration* category represent the best of both worlds, so to speak. They affirm the truths of science, but incorporate these truths into a metaphysical framework that preserves Christianity's most important ideals, like the doctrines of creation and human providence. For those who advocate a natural theology, there is evidence in science that supports the existence of God. We saw how the concepts of irreducible complexity, specified complexity, and the anthropic principle point to an intelligent Designer. Barbour "[does] not believe that design arguments of this kind are conclusive when taken alone," but "they can play a supportive role as part of a theology of nature." Another reason why the doctrine of intelligent design is not up to the task of reconciling science and Christianity is that it points only to a deistic God, not a father-figure God who answers prayers and intervenes in every person's daily life. In fact, this is Barbour's main objection to natural theology, "that we are left with a distant and inactive God, a far cry from the active God of the Bible who continues to be intimately involved with the world and human life."¹⁴⁸ While many Christians may uphold intelligent design as a fruitful settlement between science and Christianity, for many scientists, intelligent design remains a fallacy.

At last we come to it - Barbour's personal beliefs on the relationship between science and Christianity. He writes, "I am in basic agreement with the 'Theology of Nature' position, coupled with a cautious use of process philosophy."¹⁴⁹ We saw two theologies of nature with Teilhard and Peacocke. Teilhard found room for scientific

¹⁴⁸ Ibid., 246-247.

¹⁴⁹ Ibid., 105.

knowledge by interpreting the Bible metaphorically. He believed cosmic evolution was designed to produce human beings able to relate as conscious beings to Christ and God. However, Teilhard's scheme fails to capture the image of the universe as a single, interdependent organism where God is immanent as well as transcendent. However, this understanding of the universe is captured in Peacocke's theology of nature which is much closer to Barbour's own beliefs. For Peacocke, God uses the interplay between chance and law to continuously create the universe through the processes of cosmological and biological evolution. Consciousness enables human beings to be kind, loving, and compassionate, but it also enables evil and suffering. Let's venture deeper into Barbour's perspective.

What better place to start than at the beginning? Barbour finds no problem with the scientific theory of the Big Bang, nor does he believe this theory conflicts with the Christian account of creation. He says, "the theist can indeed see [the Big Bang] as an instant of divine origination."¹⁵⁰ This compatibility arises from a metaphorical reading of the Bible. Genesis is not a factual account of history, it is a poetic account of human nature. Barbour writes, "I would list the *human experiences* that lie behind the idea of creation as follows: (1) a sense of dependence, finitude, and contingency; (2) a response of wonder, trust, gratitude for life, and affirmation of the world; and (3) a recognition of interdependence, order, and beauty in the world."¹⁵¹ While the reality of these experiences is beyond question, we can question how these experiences validate Christianity. It is not as if the Christian creation narrative is the only creation narrative to inspire these feelings. Most of the world's creation stories reflect these experiences.

¹⁵⁰ Ibid., 199.

¹⁵¹ Ibid., 202.

It seems that Barbour's list of human experiences has more to do with human nature than with the Christian idea of creation. Barbour actually recognizes this point in writing, "[creation stories] portray basic relationships between human life and the world of nature," but it is the relationship that is real, not the way it is portrayed. One could say that science portrays these relationships, but then science begins to resemble another creation story in some respects. The truth of the matter is that science does not portray the relationship between human life and nature, science describes the actual relationship between human beings and nature. In fact, science probably elicits Barbour's list of human experiences even more honestly and effectively than the chapter of Genesis.

Besides the aspects of human nature wrapped up in the story of Genesis, there are also reflections of the nature of God in Genesis, according to Barbour. Barbour points to three theological affirmations in the Christian narrative of creation: "(1) the world is essentially good, orderly, coherent, and intelligible; (2) the world is dependent on God; and (3) God is sovereign, free, transcendent, and characterized by purpose and will."¹⁵² To affirm something is to assert the truth of something, so Barbour is making truth claims about God based on the chapter of Genesis. This idea recalls the distinction between scientific materialism and biblical literalism regarding the constitution of truth. For the former, the scientific method is the only reliable path to truth. For the latter, all truths come from the Bible. There is no scientific evidence that proves the world is good. There is no scientific evidence that proves the world depends on God. There is no

¹⁵² Ibid., 202.

scientific evidence that reveals God's purpose or will. It seems that, for Barbour, biblical truth takes precedence over scientific truth in some cases.

This being said, science has not disproved, and may never disprove the existence of God. But does the burden of proof fall on the Christian to prove God's existence, or does it fall on the skeptic to prove God does not exist? On this point, we must refer to Bertrand Russell, and his famous china teapot analogy. Russell writes:

Many orthodox people speak as though it were the business of sceptics to disprove received dogmas rather than of dogmatists to prove them. This is, of course, a mistake. If I were to suggest that between the Earth and Mars there is a china teapot revolving about the sun in an elliptical orbit, nobody would be able to disprove my assertion provided I were careful to add that the teapot is too small to be revealed even by our most powerful telescopes. But if I were to go on to say that, since my assertion cannot be disproved, it is intolerable presumption on the part of human reason to doubt it, I should rightly be thought to be talking nonsense.¹⁵³

By Russell's evaluation, the burden of proving an invisible deity exists falls on the dogmatist, not the skeptic who reserves judgment until all the data is in.

We turn now from Barbour's take on creation to his position on Christ. Barbour thinks of Christ, like most Christians do, as the pinnacle of human nature, a role model for people to emulate. He writes, "[in Christ] we see the character of God's purpose for human life, the fulfillment of human nature."¹⁵⁴ Christ is a great figure to emulate. The Christ of the Bible cares for everyone equally, and puts all others before himself. But Barbour also says, "The Christian community has experienced through the story of Christ the *power of reconciliation* overcoming estrangement – or, in more traditional

¹⁵³ Bertrand Russell, "Is There a God?" written in 1952 for *Illustration* magazine of London, printed in *The Collected Papers of Bertrand Russell: Volume 11 – Last Philosophical Testament 1943-1968* (London, England: Routledge, 1997).

¹⁵⁴ Barbour, *Religion and Science*, 272.

terms, redemption overcoming sin.”¹⁵⁵ For Barbour to believe that reconciliation in Christ is the path to overcoming sin, he must first believe that sin in the Christian sense is real. Sin is a general estrangement from God’s will, and, according to the Bible, people are inherently sinful because Adam and Eve ate the fruit from the tree of knowledge of good and evil in the Garden of Eden, and in so doing cast humanity into a future of innate sinfulness. But this understanding of Christ and sin flies in the face of science. Adam and Eve have no real place amongst the theory of biological evolution. The Garden of Eden is not a real geographical place that science can investigate. And there is no sin in nature, there is only survival, and life and death. For many, like Barbour, there is nothing more fundamental to a Christian lifestyle than faith in Christ’s atoning death. As we saw earlier with Kierkegaard, this religious faith is intrinsically irrational and stands outside of science as such.

But there is more than faith behind Barbour’s relationship with Christ. For Barbour, Christ is actually part of the overall process of evolution, he writes:

I suggest, then, that in an *evolutionary perspective* we may view both the human and the divine activity in Christ as a continuation and intensification of what had been occurring previously. We can think of him as representing a new stage in evolution and a new stage in God’s activity. Christ as a person (not just as a body) was part of the continuous process that runs back through *Australopithecus* and the early forms of life to those atoms formed in primeval stars.¹⁵⁶

Here, Barbour suggests that Christ is part of cosmological and biological evolution. According to neo-Darwinism, the macroscopic process of evolution is driven by microscopic mutations on the molecular level of DNA. If Barbour’s statement is true, then Christ not only has DNA like the rest of us, but his DNA can be traced back

¹⁵⁵ Ibid., 272.

¹⁵⁶ Ibid., 274-275.

through history to the same common ancestor that human beings share with apes. Never mind the question of how Christ obtained a Y-chromosome given the doctrine of immaculate conception, it is simply absurd to suggest that Christ is naturally evolved in the same sense that human beings are naturally evolved; this suggestion flies in the faces of both scientific knowledge and Christian doctrine. It is becoming increasingly clear that Barbour is a Christian first and foremost, meaning Christianity presupposes and overrides the truths of science.

In the preceding paragraphs, we have seen how Barbour supports the “Theology of Nature” position, but how does process thought factor in to Barbour’s worldview? Simply put, process thought embodies the modern understanding of the world. Barbour highlights six distinct problems that have plagued past philosophies, religions, and theologies, but which he believes process thought overcomes: (1) Human Freedom, (2) Evil and Suffering, (3) “Masculine” and “Feminine” Attributes, (4) Interreligious Dialogue, (5) An Evolutionary and Ecological World, and (6) Chance and Law.¹⁵⁷ Humans are free because God is persuasive, not omnipotent and predetermining. Evil and suffering are necessary byproducts of consciousness, and God is with us in our suffering and working with us in redemption. In process theology, masculine and feminine qualities are integrated in a new wholeness in God. Process thought allows us to find God’s work throughout history and nature such that different religions are simply different versions of the same truth. Evolution is a process evoked by God, but not controlled by God. The universe is dynamic and interdependent, and God is another entity in the cosmological scheme. In Barbour’s view, and this view is based on process

¹⁵⁷ Ibid., 323-324.

thought, God is not a monarch, but a “leader of the cosmic community,” a “wise teacher, who desires that students learn to choose for themselves and interact harmoniously.” God’s role in the universe and in our lives is “creative participation and persuasion in inspiring the community of beings towards new possibilities of a richer life together.”¹⁵⁸ There is no denying the nobility and goodness of this God. Perhaps it is this concept of God which has the power to unite people of a wide array of religious backgrounds.

In considering all the positives of process theology, have we strayed so far from the Bible that we are no longer in the domain of Christianity? Barbour argues that we have not strayed too far. He argues that “in process theology we can discuss God’s action in nature, in religious experience, and in Christ,” so that “continuing creation and redemption are brought within a single framework.” In this view, Christ is the “incarnation of the logos, the universal source of order, novelty, and creative transformation.”¹⁵⁹ For Barbour, the Christian notion of sin is compatible with process thought when sin is viewed as alienation from God, a denial of God’s calling, or a violation of the interdependent relationships that hold our universe together. Prayer, then, is a declaration of openness to God’s calling. In process theology, God supplies every entity with an initial subjective aim, and individual aligns him or herself with this aim via prayer and worship.

It is in the idea of the Holy Spirit that Barbour believes we find the strongest resemblance between Christianity and process thought. Barbour writes, “I submit that it is in the biblical idea of the Spirit that we find the closest parallels to the process

¹⁵⁸ Ibid., 322.

¹⁵⁹ Ibid., 298.

understanding of God's presence in the world and in Christ."¹⁶⁰ The Holy Spirit is one-third of the triune of God. The Holy Spirit is everywhere at all times. We find the same immanence in the God of process theology. Also, we saw earlier the primordial nature of God in process theology in that God is with all creation. We find the same idea in Psalm 104:30, "When you send your Spirit, they are created, and you renew the face of the earth," as well as in John 14:17, "But you know him, for he lives with you and will be in you."¹⁶¹ Barbour also notes that Christ received the Holy Spirit at his baptism (Mark 1:10), that the Holy Spirit inspired the prophets (Isiah 42:1), and that the Holy Spirit continues to inspire modern believers during prayer and worship (Psalm 51:11, Romans 8:26, and Jude 1:20). By this analysis, there seem to be many similarities between the Holy Spirit and the God of process theology.

In fact, the idea of the Holy Spirit is Barbour's ultimate solution to reconciling scientific and Christian thought. After more than three decades of researching the relationship between science and religion and publishing numerous books on the topic, Barbour turns to the Holy Spirit to end the strife between science and Christianity. He writes:

Perhaps, after all, we should return to the biblical concept of the Holy Spirit. The spirit is said to indwell, renew, empower, inspire, guide, and reconcile. Reference to the Spirit can help us to avoid the separation of creation and redemption that occurred in much of classical Christianity. It is free of the male imagery so prominent elsewhere in Christian history. It will help us recover a sense of the sacred in nature that can motivate a strong concern for the environment today. The Spirit is God working from within in both human life and the natural world, which is consistent with process thought but can also be expressed through other models. The theme of the 1991 assembly of the World Council of Churches was a

¹⁶⁰ Ibid., 298.

¹⁶¹ Verses from *Holy Bible: New International Version*, (Grand Rapids, MI: Zondervan, 2005).

prayer in which we can join: 'Come, Holy Spirit, renew thy whole creation.'¹⁶²

We cannot deny the similarities between the Holy Spirit and the God of process thought. Nor can we deny the importance of replacing male chauvinism with gender equality, and environmental negligence with environmental responsibility and love in this modern age, but we can question, and we may be right to question, the role of the Holy Spirit in ushering in these new concerns. In the end, however, we cannot accept Barbour's endorsement of the Holy Spirit as the ultimate solution to reconciling science and Christianity.

What conclusion can we accept then? First off, we must be skeptical of all worldviews that rely on metaphorical interpretations of holy texts because any interpretation is by definition a deviation from the original meaning of the text. When we turn to metaphor, we are turning away from literality, which in some sense is a turn away from reality. Take for example the ambiguous form of a cloud in the sky. If we were to ask one hundred people, "What does that cloud look like?" we would most likely get one hundred different answers, and no answer would describe the real form of the cloud. Similarly, we must be very careful when trying to interpret the meaning and intent behind the writings of the biblical authors, especially when human life has changed so drastically over the past few millennia.

Secondly, while Christianity has been interpreted metaphorically for centuries, science is an enterprise that, to some extent, transcends interpretation. The basis of scientific knowledge is observation. We observe the sun rising and the sun setting. We observe the way objects fall toward the earth rather than away from it. Science is a

¹⁶² Barbour, *Religion and Science*, 332.

description of these observations, and the more accurate the better. Furthermore, these observations are completely impersonal in the sense that they are the same regardless of who observes them and where. In other words, a scientific experiment, when conducted properly, yields the same results for any person in any location.

Third, the nature of faith is critical to the relationship between and Christianity going forward. Ever since the Protestant Reformation, faith in Christ has come to define authentic Christian living. In other words, if one does believe that Christ died for the sins of all humankind, then one is not a Christian. But, as we saw with Kierkegaard, faith is inherently irrational, and, as we saw with Russell, the burden of proof falls on the dogmatist not the sceptic. Surely, it is he who claims there is a teapot in orbit around the sun that must be able to prove this teapot indeed exists. It is not the purpose of this work to deny the existence of supernatural or invisible beings, this question can only be decided by the individual for the individual, but we can understand where the burden of proof lies nonetheless.

As we go back through the various approaches described in this work, it becomes clear which approaches are inadequate to the task of reconciling science and Christianity. We must be wary of all forms of Christianity that rely on metaphorical interpretation of the Bible. By this understanding, we can rule out neo-orthodox Christianity, existential interpretations of Christianity, and the linguistic view, as all of these approaches make use of extensive interpretation and ignore many blatant and important differences like the many discrepancies between scripture and scientific understanding. Furthermore, these approaches draw false boundaries between the objective and subjective, between nature and history, and between science and

Christianity. Most of the approaches of the *Dialogue* thesis require even more deviation from the cornerstone of the Christian faith, the Bible, by making adjustments to Christian doctrine to afford room for scientific knowledge. Some would argue that Christ is the center of faith, not the New Testament or the entire Bible. Yet, the Christ that most people discuss and debate is the Biblical Christ, and so we refer to the Bible here not in the narrow sense framed by, for example, Christian literalists, but in terms of the basis of intellectual debate. The idea that Christian theology fills gaps in the scientific knowledge lends more truth to the scientific enterprise than it does the Christian enterprise because it is Christianity that is being adapted to fit science. Natural theology is a dicey endeavor as it uses science, which has nothing to do with scripture, to affirm the messages of the Bible. Furthermore, even if science does point to an intelligent Designer, it is a deistic, non-interventionist Designer that is the deity of any one of the world's religions, there is no reason to suggest that this Designer is the God of Christianity. In a theology of nature, which Barbour advocates, we find the most extensive use of metaphor and interpretation as Christianity is understood in light of scientific knowledge. For example, the Bible mentions nothing about the evolution of creatures, but theologies of nature assert that God designed the process of evolution. It seems that natural theology is an attempt to find connections where there are none, and theologies of nature seem to make drastic deviations from the original scripture. Process thought doesn't violate any of the truths of science, but it still makes use of a God whose existence is undetermined. Barbour is truly on insecure ground when he affirms Christ from the point of view of process thought as Whitehead references Christ only

once in his *Process and Reality* and it is in conjunction with dancing fairies.¹⁶³ Clearly, Christ was not a necessary piece of Whitehead's metaphysics. Furthermore, as we saw earlier, process thought does not help the everyday believer to function in his or her daily life. There is no obvious moral code, no rituals or practices for appeasing God in daily life, nor is there any promise of justice at the end of life. Process philosophy is simply too abstract for the common person to find practical uses for it.

So, in the end, we are thrown back into the *Conflict* thesis. Here, biblical literalists and creationists deny scientific knowledge, and scientific materialists deny the literal truth of the Bible. The ultimate question is simple: Which account of reality is true – science or Christianity? The truth of the Bible may never be affirmed or denied in any scientific sense. Prayer yields no definitive answers about the truth of the Bible. Not to mention there are a whole host of biblical miracles that have never been successfully recreated. But the truth of science is affirmed all around us. Our cars drive down the street when we push the gas pedal. Light bulbs illuminate our homes at the flick of a switch. Cell phones allow us to communicate with people thousands of miles away in an instant. Our computers bring us all the information in the world through the internet. If reason is at all real, legitimate, and trustworthy, then we must affirm the worldview of science over the worldview of Christianity. Christianity played an integral role in human history, and Western civilization is indeed indebted to this religion of old. But perhaps Christianity has reached its pinnacle, and it is time it became part of history. In the end, it is too cumbersome to retain the majority of biblical narratives that inform the Christian consciousness. Just as it would have been theoretically feasible yet practically

¹⁶³ Whitehead, *Process and Reality*, 338.

prohibitive to calculate celestial geometries based on the heliocentric view, it is theoretically feasible to maintain a Bible-centered view of ethics, morality, and cultural value, but impractical to support a Bible-based worldview that is comprehensive for all of reality.

Perhaps it is time to look for religious feelings in the scientific narrative of the universe, as we saw with Einstein, Sagan, and Dawkins. It is possible that a day will come, as Dennett and Harris envision, when science fully understands morality, ethics, and human behavior, and if this day does come what use will we have for the religions of old? There is no need to slander religion with insult and patronization like so many scientific materialists, for there is much in the religions of the past that captures the essence of human nature. As Swimme and Berry suggest, perhaps it is time for a universal, science-based myth, where the wonderful knowledge of science inspires people to treat others with respect and kindness. Perhaps it is time that science fulfills our religious needs instead of Christianity or the other world religions. Perhaps it is time we refine particular ideologies to history, and we move into the future with a single ideology that upholds humanity as one of many species that live only by the grace of water, earth, and the sun.

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