

God of Genes: A Theology of Evolution

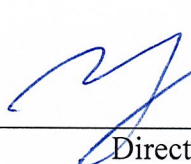
Baird Linke

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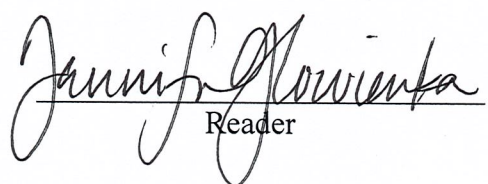
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**Abstract:**

Science and faith are held up as opposition parties in public discourse, but this is a relatively new development in intellectual history. Francis Bacon described science and faith as companion volumes written by God to teach humankind about Godself, where rather than fighting, they inform one-another. This is a case study using the traditionally controversial topic of evolution to show how we can learn about the Creator by studying Creation while respecting both our faith and our intelligence. The scientific backing for evolution is strong and is not the focus of this paper. Instead, common religious objections to the theory of evolution will be addressed with theological reflection on the theory of evolution, including scriptural debates and questions of human nature, existentialism, theodicy, and materialism. Through this process, we see that different perspectives on the same truth are not contradictory, but supplementary and are stronger together than alone.

## God of Genes: A Theology of Evolution

### Part I: Introduction

A billboard on the highway leading east from town reads “In the Beginning, God *CREATED.*” The text is set against the background of the Milky Way and in the upper left corner there is a series of primate silhouettes steadily becoming more upright until a modern human becomes recognizable, with a big red Ghostbuster’s slash through the series. A phone number at the bottom of the billboard accompanies the citation *Genesis 1:1* and invites callers to seek “TRUTH”, apparently drawing a distinction between the truths of science and the “capital-T-Truth” of the Bible. This, however, does not hold when we consider the words of Saint Pope John Paul II in his 1996 address to the Pontifical Academy of Science, “Truth cannot contradict truth” (John Paul II 1996).

In 2014, slightly more than half of all religiously affiliated adults in the United States believed in some form of evolution. Christians held true to that mark, with 55% of self-identified Christians affirming some form of the theory of evolution, some of the lowest rates among a large demographic. Within the Christian community there is a predictable trend of lesser acceptance for the theory amongst more traditional denominations—only 38% of Evangelicals and 20% of Jehovah’s Witnesses. (Wormald 2015)

Given the sharp divide in the largest religious group in the United States on the topic of evolution, and as the many parents and school board members streaming into courtrooms will tell you, the question of science and faith’s compatibility is a pertinent one. The issue of evolution has been debated around the nation in school board meetings,

sanctuaries, and courtrooms, from the famous Scopes Monkey Trial in the 1920's to Dover, Pennsylvania in 2004. In the decade between 2002 and 2012 alone, 110 antievolution bills were proposed in 26 states with Alabama, Mississippi, and Oklahoma leading the charge with ten or more bills each, and only Tennessee and Louisiana successfully passing them into law. (Johnson et. al 2016) If history is any indicator, as long as science and religion are perceived as enemies these costly and ultimately fruitless battles will continue.

What is presented here is a middle ground, an attempt to reconcile the Two Great Books of Scripture and Nature into the companion volumes that Francis Bacon described. (Bacon 1999) “Truth cannot contradict truth,” and truth should in fact inform truth. Likewise, Creation should point back toward the Creator, so this is a look at one aspect of creation—a theology of evolution. We will first understand what is meant by the theory of evolution and where the controversy lies surrounding it. The scientific backing for evolution is strong and exhaustively examined elsewhere, so defending evolution on scientific grounds will not be the focus; instead I will examine the main theological objections that are raised over evolution and provide counter-points that allow us to decipher God from genes. We will begin with the most basic objections, the literal conflicts with Scripture, and move up the scale to the more abstract areas of theodicy and materialism. An artist is never as appreciated as when their work is enjoyed, so let us join the Psalmist and be “made glad by your deeds, Lord!” (Psalm 92:4).

## Part II: Millions of Monkeys, Millions of Keyboards, Millions of Years

It is my hope that the false dichotomy of science vs. faith might be broken down and the two lenses of viewing the world will be united—the philosophical equivalent of binocular vision. It will be helpful for our purposes moving forward to have a basic vocabulary in both science and religion. A great deal of conflicts can be resolved simply by understanding each side and this debate is no different. So, before casting judgement on the validity of either side, we should be sure that we understand what is meant when we say ‘evolution’ or ‘science’ or ‘religion.’

### 1) Science

Science is a system of thought that is uniquely qualified to answer the question “what just happened?” It is a strategic plan for answering questions with a lot of confidence, ruling one possibility out at a time, and building off each previous test and expanding out in many directions from there. When scientists have an idea as to why or how something happens, they try and prove themselves wrong, which is experimentation. Scientists put each part of an idea on trial to put together the most accurate picture they can of how something happens and what all goes into it.

For example, we might imagine that if a flower’s color was a blend of its parent’s colors, we would expect a white and red flower to produce pink flowers when crossed. If we crossed a red and white flower and found that the offspring were in fact pink that would tell us that it is possible that color is a blend of parental colors. But if all the offspring were red, we would be able to definitively say that the color of the offspring is NOT determined by blending the parent’s colors, and that something else must be going on. When we perform an experiment we never *confirm* a hypothesis, we can only ever

reject or fail to reject the hypothesis. This does not mean that we cannot trust science; if anything it should reinforce the notion that scientists don't put forward an idea without rigorously testing it. To the scientific lay person, this insistence on specific words and phrasing may seem like splitting hairs, but specific terminology is important to understanding the philosophy of science. Unfortunately, this often leads to a language barrier between the public and the scientific community

There is a common misunderstanding outside of the scientific community surrounding the word 'theory'. Theories in science are not hunches or gut-feelings, however theories might be viewed in the public. A theory in science is an idea or system with the most explanatory power. These are broad, umbrella principles that are useful for making accurate predictions and explanations. They are supported by thousands of individual experiments testing different aspects of the theory so that by the time it is ready to be called such, the theory will be robust and powerful. For example, Germ Theory is a broad explanation for how a wide variety of diseases are caused by microorganisms, too small to be seen with the naked eye. When Germ Theory was being developed in the 1800's it met a fair amount of opposition but as more and more tests were carried out and the understanding of disease grew, Germ Theory began to grow in reputation. It would be impossible to understand modern medicine without Germ Theory and treating disease would be infinitely more difficult. Instead of being a collection of unrelated facts or treatment recommendations made cook book-style, medicine is put into a framework that allows for creativity from health-care professionals to solve unique problems.

It seems counterintuitive, but in science theories have more explanatory power than facts. Facts in themselves are useful, but they only tell us *that* something happened, not why. “A man has a slap mark on his cheek” and “a man is wearing a shirt reading ‘God’s Gift to Women’” are two separate facts that don’t tell us much of anything on their own. When we learn that the man wearing the shirt also has the slap mark on his cheek, we start to wonder if there might be any connection between the two facts. These possible connections lead to all sorts of interesting questions and the more related facts we bring in, the better questions we can ask. The more facts we collect (a woman delivered the slap after a brief courtship-related conversation) and the more questions we ask (“Do *all* men wearing similar shirts get slapped?”) and answer (not all, but most) will help us form a theory about slapping: *The Courtship Theory of Getting Slapped*. Of course, in an investigation of how not to get slapped, as in many other investigations, the failures will likely teach more than the successes. This is not a particularly scientific example, though it illustrates the scientific framework rather well.

Science is remarkably powerful in its ability to describe and understand the world but it makes no claim on the ultimate nature of reality. Science can describe *what* the laws of probability, and thermodynamics, and planetary motion are but it cannot, and notably does not, make a claim about *why* those laws are. French psychologist and philosopher Maurice Merleau-Ponty encourages us to consider “whether science does, or ever could, present us with a picture of the world which is complete, self-sufficient and somehow closed in upon itself, such that there could no longer be any meaningful questions outside this picture.” This is where we draw the distinction between natural science (an area of study focused on physical phenomenon) and materialism, which is a



philosophical view that affirms that natural science is the only way of accurately understanding the world. Merleau-Ponty rejects materialism, describing the development of scientific laws and theories as “knowledge by approximation.” He does this not to devalue natural science or what it can teach us, but to remind us that it cannot contain the entirety of reality. Quantum physics teaches us that the scientist is limited by his or her own perspective in their ability to observe and measure a phenomenon because at a certain point, simply measuring a phenomenon changes its results. Merleau-Ponty values what science offers but he points out that “painting, poetry, and philosophy have forged ahead bravely” to provide a medium in which to discuss what science cannot describe.

## 2) Evolution

Evolution is not a random process of development reminiscent of millions of monkeys pounding millions of keyboards for million years and hoping to crank out the completed works of Shakespeare, as it is often represented. Evolution is the process of change in a population of organisms over time as genes change frequency in the population. If we imagine the human genome (the collection of all the genes in a single human) as a hardware store, each gene would be a type of tool or part. Every hardware store will have, for example, rubber mallets, but the color of the mallets or the type of grip can differ between stores. It’s still a rubber mallet but there are variations possible under class of tool called “rubber mallet”. If a store tries to sell a mallet that is too different, to the point that it cannot do its job as a rubber mallet, it will be less successful and stores in the future won’t sell that model of mallet. However, if that mallet is no

longer functional as a rubber mallet but a customer finds a use for it by pounding nails, the store might keep that model and future stores will sell that model to pound nails. Of course, our Genome Depot cannot simply stop selling rubber mallets, but it might add the new hammer to its inventory.

On a more practical level, every human carries a copy of the gene that encodes for a specific clotting factor in the blood. This gene is important because humans would not still be around if we were doomed to bleed out every time we got a paper cut or skinned a knee. There are variations between humans on how exactly their cells synthesize this clotting factor, but as long as it stays within a certain margin of error, those variations will be more or less inconsequential. If someone has a copy of this clotting factor gene that is so different as to be ineffective, this person will be in trouble. This condition is called hemophilia.

Hemophilia is a dangerous illness so we wouldn't expect to find very high rates of it anywhere—people would likely die before being able to pass it on—but today hemophilia is almost as synonymous with the royal families of Europe as a pronounced under-bite. Hemophilia the trait first showed up in the family with Prince Fredrick of England (though pedigree analysis shows that the *gene* showed up further back with Queen Victoria) and the condition began occurring with much greater frequency within the royal families than in the general population because of the exclusive royal inbreeding. The reason the gene was preserved in the royal family, despite the massive problems it causes, is likely because they had access to better medical care and were less likely to be in risky physical situations than common people. The population in this case (European royalty) had begun expressing higher than average rates of a specific trait.

Evolution proceeds in response to pressure to control a certain gene in the population. In the case of hemophilia, the pressure to keep the clotting factor gene functional comes from the fact that people have a history of dying when they lose all their blood. When the pressure is lifted (by a posh royal lifestyle) or counter-acted by a stronger pressure (a familial expectation to marry well), the gene will start to behave differently within the population. No groups with a stance on the issue (including Young-Earth Creationists) deny that evolution happens on this level because we see the process and its results every time we pet a bulldog, hear about antibiotic resistant bacteria, or eat any product that contains corn. (Morris 1996) Bulldogs and corn are the result of selective breeding, also called artificial selection, which is when humans decide what traits they want to see more of in future generations. In the case of antibiotic resistant bacteria, we apply a pressure which, from the perspective of the bacteria, favors one trait (antibiotic resistance) heavily. The debate instead comes from the concept of macroevolution, or the derivation of extant (current species) from ancestors of a different species.

Creationists are concerned with this idea on theological grounds, which will be investigated in detail later, and justify their concerns to the secular world with scientific objections. A common argument put forward by creationists is that it would be impossible for the diverse body plans and structures we see in modern animals and plants to develop from one ancestor as evolutionary theory and modern genetic analysis would indicate. It does seem absurd that the pressures of natural selection might produce such many and varied structures as wings, and mitochondria, and leaves, and stingers, and

eyes, and compound eyes, but a closer examination shows that it is not so far-fetched an idea.

The driving force of evolution can be summed up like this: be fruitful and multiply. There is an incredible degree of freedom in this framework to go all-in on any idea to make surviving long enough to reproduce a reality. Because of this, if you talk to an evolutionary biologist long enough, you'll soon come across the idea that there is no such thing as a "highly evolved" organism. Every living thing has been fine-tuned by a long history of genetic tweaking to give it a high chance of successfully passing on its genes. Bacteria know their craft as well as lions or swordfish (or humans). There is not a specific organismal goal, an ultimate "pinnacle of evolution", but that is not the same as saying it is unguided. Evolution is driven by the laws of probability acting through reproductive success of molecules which are capable of self-replication. This is an unfeeling product of probability and as such whatever works to meet that requirement will be conserved. It would be equally absurd to criticize a fish for not roaming the Outback as it would be to say that kangaroos are failures because they don't have swim bladders.

But how does this translate into the variety of life today? Here we call back the vision of the monkeys on the keyboards. The cosmic monkeys have been spinning through space for eons, each desperate to be known by and to know its peers, yet unable to express itself or understand the expressions of another. Let us say they stumble along a mass of cosmic keyboards with buttons with arbitrary markings covering them. In a primordial state of language the monkeys have unlimited freedom to pound out any series of characters but this series of endless raw material (characters) isn't successful at

communicating anything. But let us now imagine that the monkeys, while pounding on their keyboards begin to critique each other's work. They begin to recognize that they can make more sense of one-another if specific symbols in a specific order represent something real and concrete. They have just invented words. In the context of biology this would be the formation of organic molecules.

The monkeys realize that using these specific textual stand-ins for actual things is a much more effective strategy of expression than spewing streams of characters into the void. Some monkeys commit to using 'I' as a character representation of the idea of self, others choose the character series 'y-o' to do the same, still others elect 'i-c-h', 'm-o-i', and 'J-e-g'. Each choice will fit the bill. One of them takes fewer letters, one is more aurally distinct, some choose to require specifically a capital version of the letter and others don't mind one way or the other, but ultimately the effect is that they have a committed representation now, based on arbitrary marks on a page but nevertheless committed. They do the same for all other things worth representing. 'B-a-l-l', 'b-a-l-o', 'b-o-l', and 'b-a-l-l-o-n', all represent a round object that they might play with. As their vocabulary increases the monkeys become more and more committed to staying within their systems of representation, as they will not be understood as well if they start referring to *moi* while in a group of monkeys that all refer to *ich*. In biology, the monkeys just committed to a specific energetic or respiratory strategy.

From here we will follow the monkeys that use a category of words we will call, arbitrarily, English words. They are much more efficient in communicating with their peers than they once were because they use the same character representations but there is still a disconnect between them. How are the monkeys to make sure that they are

understood when they want a specific action to be done to a specific object? How should they indicate this? The only way to do this is to include a specific subject and a specific action—every monkey, regardless, of what system they use sees this to be true. The group of English monkeys we have been following decide that the subject should stay separate from the action, which works fine for them. The monkeys who use the system we will call Spanish agree that they will say each action in a way that can indicate the subject at the same time. They will only specify a subject if it is ambiguous in the context. Again, this works for them, but probably won't work for the English monkeys because they haven't structured their system that way. They have committed to a specific framework to work within. In biological context, the monkeys have committed to a body plan. Tail must come after nose for these monkeys, whereas the tail could easily be indistinguishable from the nose for another group of monkeys.

So now the monkeys decide to figure out the best way to express themselves with stories and each one sets itself to writing. They break up based on the kind of stories they choose to write. Some monkeys decide that they will write from the perspective of a particular character, others decide they will write from the perspective of an unattached observer. Both equally good tactics but once chosen, the monkey is committed to that style—it won't make sense otherwise. Some monkeys decide to focus on a monkey that is a female monkey and others decide to focus on monkeys that are male, some write in a way where the story starts at one point in time and proceeds linearly while others choose a cyclical pattern. Some decide to set their story in a place that really exists and others decide to invent other worlds and give new words to describe them.

One monkey decides that he will write from the third person and employ other monkeys to give voice to each of his characters. He decides he will write about a male monkey and a female monkey and their story will proceed linearly, that they will be set in a place called Verona, and that his story will be about love. He labors for a while over the words he should use to name his monkey characters and he decides the male will be called Romeo and the female will be called Juliet. In evolutionary terms, *Romeo and Juliet* is a unique species.

Of course, every analogy limps at a certain point but let me clarify a couple ideas. Evolution is guided by the laws of physics and of probability. These are characteristics of the universe that A) allow molecules to form that are capable of self-replicating, and B) determine that molecules that are good at self-replicating will continue to do so, and any random event that makes these molecules better at self-replicating will be preserved. Likewise, molecules that are not as successful or take on less-efficient methods of self-replication will fail and fall out of circulation as resources and raw materials are taken up by the growing number of efficient molecules.

For the monkeys, this probability-driven force of self-replication is represented by self-expression. Ideas (in an abstract philosophical sense) are a stand-in for genes. Language is a stand in for Life in this analogy. Initially there are thousands upon thousands of ways one can choose to establish the foundation of a language but the action of electing one (relatively arbitrary) structure is equivalent to committing to it. Once committed, breaking out of that structure causes the whole thing to fall apart.

### 3) Religion

For the purposes of this paper, any statement about God—God’s existence or non-existence, the exact character of God, etc.—are considered ‘religious’ claims. The goal of any religious statement, be it from Christianity or atheism, is to make a claim about how the universe got to be as it is. It is inaccurate to portray any of these beliefs as “scientific.” At the end of it all, the atheist and the Christian both make a leap of faith that goes beyond what science describes to form their respective understandings of the ultimate nature of reality. This leap is not unfounded, in either case, by experience. (Indeed, every experience can be seen as positive confirmation bias for either claim.) There is more to human experience than material data however, and it is into this area that religion (whether theism or atheism) steps.

This investigation is particularly concerned with how evolution might inform the Christian faith and will assume general Christian beliefs as the framework to work in. Therefore, recognizing the necessary blasphemy for the sake of this conversation, I offer the following definitions of God.

1. Infinite
2. Trinitarian
3. All-Good (Loving)
4. All-Knowing
5. All-Powerful

It will also be useful to bear in mind certain limitations as we go forward. Language necessitates that we talk about one thing at a time, which can lead to the impression that some interrelated things are distinct and separate from each other. In this paper, we are discussing the relationship between evolution and faith by taking one part



at a time, and it will be important to bear in mind that we are dealing with parts of the whole. It is easy to imagine physical realities and spiritual realities as existing completely independently of one another but this is not the case as far as the Christian tradition is concerned. There is a distinction drawn between the idea of souls-with-bodies and of embodied souls in Christian spirituality. See the Nicene Creed in which Jesus is “God from God...consubstantial with the Father, begotten not made...who came down from heaven and became man.”

Through the course of this discussion out of linguistic necessity some physical phenomenon will appear to be separate from the spiritual realities they reflect, but it is important to remember that we are examining one facet of the same gem and not lose sight of the forest for the trees.

With this framework established, we begin our conversation of a theology of evolution.

### Part III: “Thus Says the Lord”

Let us begin with the first and most obvious Christian objection to the theory of evolution: it conflicts with a literal interpretation of Scripture. As the billboard mentioned above helpfully reminds us, the Bible begins with the Genesis account of Creation and the words “In the beginning, God created the heavens and the earth.” (Genesis 1:1) This is no minor claim but rather the foundation for everything that is to follow. Nothing in Scripture makes sense without the understanding of God as the Creator of the universe. If there is any realm that exists outside of God’s creation, God cannot be all-powerful, and if God is not all-powerful there is no reason to offer the worship of humankind to God.

Therefore, we have to reconcile the Biblical Creation stories with evolution before we approach any other topic.

The lynch-pin of the scriptural objection to evolution is the question of reliability of the Bible. For many Christians the very phrase “Biblical interpretation” is offensive—what is there to interpret when it comes to God’s word? This is a straight-forward understanding of Scripture but we are wrong if we think it makes reading the Bible simple. There are many instances in the Bible where the same event is recorded differently. For example, the Gospels record different numbers of Jesus’ visits Jerusalem during his ministry. Matthew and Mark record only one (Matt. 23, Mark 11), Luke reports four separate visits but only two during his ministry (Luke 4 & 19), and John mentions four *during* his ministry (John 2, 5, 7, and 12). Each of the Gospels record his Triumphal Entry on Palm Sunday, but the rest are unique, bringing the total up to five unique stories of Jesus entering Jerusalem during his ministry (and twice as a child in Luke).

This, perhaps, does not seem like a point demanding theological gymnastics, but it raises the question; how much are we allowed to read into the text? Is the Gospel of John wrong because it records more visits to Jerusalem than Mark? Or is Matthew incorrect because it makes no mention of Jesus’ childhood visits that we see in Luke? Can we read Mark and assume that the stories told in the other Gospels still happened even if they aren’t mentioned specifically in Mark? For almost any Christian, the answer would be yes, indicating that some reading between the lines is not only allowed, but may in fact be required for a complete understanding of the text. For an interpretive precedent

regarding conflicts between Scripture and the natural sciences we turn to Galileo Galilei and his defense of the heliocentric solar system.

There is a legend surrounding the infamous trial of Galileo in 1633. When he stood before an Inquisition court in Rome to publicly renounce his statements about a heliocentric solar system, and affirm the geocentric model professed by the Church, he finished his renunciation with an under-the-breath act of rebellion. Bending low in the courtroom at the end of his speech, after publicly proclaiming his arguments for a mobile Earth to be a mistake, he allegedly whispered “*Nevertheless it moves*”.

The heliocentric model of the solar system stood in contradiction to Joshua 10:12-13, in which “the Lord delivered up the Amorites before the children of Israel, and he said in the sight of Israel, ‘Sun, stand thou still upon Gibeon; and thou, Moon, in the valley of Ajalon.’...So the sun stood still in the midst of heaven, and hasteth not to go down about a whole day.” Galileo’s conflict with the Church stems from the implication of this verse that the sun orbits the earth through ‘the midst of heaven’ (Finocchiaro 2008). Galileo’s insistence on the model proposed by Nicholas Copernicus, that the sun is stationary and the earth orbits around it brought him into conflict with this traditional interpretation of Joshua. The trial anecdote has propelled Galileo Galilei to punk-rock status as a symbol of scientific rebellion against religious ignorance, and one certainly has to admire the spunk of the sixty-nine-year old astronomer. Unfortunately, both this story and the Inquisition unnecessarily paint Galileo in a confrontational light when it comes to his relationship to faith and reason, and more specifically to Scripture.

Galileo is the handy hammer for every conversation regarding the conflicts in interpretation between the Bible and scientific research. He is justifiably held up as a

martyr of scientific research and the go-to example for those who argue that science and religion are inextricably opposed. However, Galileo was a deeply religious man and spent a large portion of his time after beginning to research the Copernican model of the solar system arguing in favor of the compatibility of reason and Scripture. He wrote two famous letters, the *Letter to Castelli* in 1613 and *Letter to the Grand Duchess Christina* in 1615, arguing for a reconciliation of science and Scripture. He politely encourages his readers to consider, not the inaccuracy of Scripture, but the fallibility of the interpreter.

One of these [failings] would be very serious and very frequent, namely, to want to limit oneself always to the literal meaning of the words; for there would emerge not only various contradictions but also serious heresies and blasphemies, and it would be necessary to attribute to God feet, hands, and eyes, as well as bodily and human feelings like anger, regret, hate, and sometimes even forgetfulness of things past and ignorance of future ones. (Galileo 1613)

Due to the need for the interpretation of Scripture, Galileo requests that “in disputes about natural phenomena it should be reserved to the last place”. (Galileo 1613) Scripture was given to mankind so that everyone (importantly for his argument, of every intellectual ability) might come to know God, and as such is adapted “to the understanding of all people.”

In light of this, he argues that some of the truths in Scripture are presented in a simplified form to accommodate the limitations of human understanding. It is no accident that Jesus taught in parables as the Kingdom of Heaven is too abstract a concept for our minds, limited as they are by temporality and physical space, to comprehend fully. Likewise, it is telling when he tells his disciples that his lessons are deliberately ambiguous so they might continue to ponder them. “This is why I speak to them in

parables: ‘Though seeing, they do not see; though hearing, they do not hear or understand.’ (Matthew 13:13)

Galileo presents an approach to Scripture that maintains its exalted position as communication between God and humankind while simultaneously providing enough interpretive lee-way to apply our reason to understanding the underpinnings of the Universe. “I do not think one has to believe that the same God who has given us senses, language, and intellect would want to set aside the use of these and give us other means the information we can acquire with them, so that we would deny our senses and reason even in the case of those physical conclusions which are placed before our eyes by our sense experiences or by necessary demonstrations,” Galileo says in his letter to the Grand Duchess Christina. His suggestion, then, is that one ought to trust Scripture for points important to the faith which cannot be determined except through encounter with the divine. (Galileo 1613)

Saint Augustine, a thinker well-respected both as a theologian and for his influence on modern philosophy, provided support for this view as early as the 4<sup>th</sup> Century with his *Literal Meaning of Genesis*. For Augustine, the use of ‘literal’ in his title represented his desire to show things as they were, not necessarily to take the Genesis account of creation as verbatim truth. “The Spirit of God who was speaking through [the Scriptures] did not wish to teach people about such things that would contribute nothing to their salvation.” (Augustine 2002) Augustine emphasizes the role of Scripture to inform on spiritual matters, rather than as a biology textbook. He argued that the role of the exegete is to show how Scripture and the well-supported demonstrations of science and reason are not contradictory. (Fiedrowicz 2002)

What then is to be made of the story of Creation? The familiar Seven-Day Creation narrative is Genesis 1:1-2:3 during which God makes in order:

1. Light and Dark (Day and Night)—Genesis 1:3-5
2. Separation of the ‘waters’ into Heaven and the Earthly Realm—Genesis 1:6-8
3. Earth and Sea, Plants—Genesis 1:9-13
4. Sun, Moon and Stars—Genesis 1:14-19
5. Sea Creatures and Birds—Genesis 1:20-23
6. Land Animals and Humans (Male and Female)—Genesis 1:24-31
7. Rest—Genesis 2:1-3

This Creation narrative is the most often-cited when debating evolution on a Biblical basis. The most conservative argument goes: life could not be the result of millions of years of evolution if God created each organism from scratch in a timeframe of seven, twenty four-hour, days. Slightly more liberal traditions are willing to grant that the word ‘day’ as used in this Creation narrative does not necessarily mean a 24-hour period of time, but could be a metaphorical representation of the period of time within which God worked on each specific project. If this were the only Creation narrative in the Bible, the argument of Biblical inerrancy would be fairly straightforward.

Genesis 1:1-2:3 is not, however, the only Creation narrative. The very next verse states “These are the generations of the heavens and the earth when they were created, in the day that the Lord God made the earth and the heavens,” and continues on to tell another story of creation in which the order of events does not quite line up. In this narrative, man is created first (and separately from woman), “of dust from the ground” (Genesis 2:7). The general order of Creation in this narrative goes like this:

1. Man (from pre-existing barren ground)—Genesis 2:4-7
2. Garden of Eden (all edible and aesthetically pleasing plants, including the tree of the knowledge of good and evil)—Genesis 2:8-10
3. Rivers Pishon, Gihon, Tigris, and Euphrates (which flow into pre-existing lands)—Genesis 2:10-14
4. Every Beast of the Fields and Bird of the Heavens—Genesis 2:19
5. Woman—Genesis 2:20-22

Obviously these two narratives cannot both be simultaneously literally true. In the first, humankind is created simultaneously as the culmination of all creation before them. In the second, man and woman are created individually and as book-ends of Creation, at the beginning and end.

As Pope John Paul II reminds us, “Truth cannot contradict truth” so this begs the question: what is the truth here? (Paul II, 1996) In light of the explicit contradictions in the order and circumstances between the two narratives, it does not seem unreasonable to conclude that the literal interpretation of these stories is not the intended one. What we are left with then is a description of Creation centered not on physical details, but on the relationship of God and humanity and humanity and the rest of Creation.

Let us put ourselves in the shoes of the Israelites hearing the opening lines of Genesis. “In the beginning, God created the heavens and the earth. The earth was without form and void, and darkness was over the face of the deep. And the Spirit of God was hovering over the face of the waters.” (Genesis 1:1-2) Water is the element of chaos, being formless and void, and is the physical representation of entropy. In baptism, we are drawn from the waters to new life, representative of being pulled from chaos into the

order of the Christian life. In other words, God brings order to chaos, or God imposes laws that order the universe. This is an understanding of Biblical Creation that describes how God relates to Creation (i.e., that God did it) but doesn't belabor the details of how. If God brings order to chaos, humans applying their reason should be able to piece together how that works, and in fact we can. We can describe and quantify the laws of thermodynamics and gravitation and others. Nowhere in this arrangement is it implied that understanding what God did is the same as proving that God didn't do it.

Looking a little farther ahead, we see that humans were created specially by the Lord, but before we get too big for our collective britches, we ought to be reminded that humans were made both to be the crown-jewel of Creation in the image of the Lord and dust-covered gardeners. When we take both Genesis accounts of creation together, we find ourselves in a special place in Creation, as the only organisms that can participate in the Lord's creative process, and undeniably as just another *part* of the whole picture. We are Creation's high masters ("let them have dominion...over all the earth" Genesis 1:26) and its lowest servants ("there was no man to work the ground" Genesis 2:5).

This understanding of Creation is not exclusive of evolution. Nothing could be a more humbling reminder of our nature as a member of creation than learning that we share more than half of our genetic make-up with fruit flies, with the possible exception of learning that we are equally related to the bananas they eat. This understanding of our connectedness to the natural world reinforces the understanding of Christian stewardship in which humans are expected to care for what God has given us, illustrated in the Parable of the Talents. (Matt. 25:14-30)



This is in no way a denial of our uniqueness in Creation. Evolution simultaneously emphasizes the aspects of organisms that make them distinct and those that relate them to one another. When we recognize our unique intellectual abilities and our inextricable relatedness to all the rest of life on this planet we can truly understand our position within Creation. We are created beings, by a God that brings order from chaos, we are unique in creation in our ability to encounter the divine, and we are created, along with all of Creation to be “very good.” (Genesis 1:31)

Jesus himself draws a distinction between two types of life, recognizing that humans occupy a dual nature as biological and spiritual beings. In John 10:10 he tells his disciples that he “came that [they] might have life and life to the full,” specifically using the Greek word *zoe* instead of *bios*. *Zoe* is spiritual, infinite life while *bios* is life in the strictly physical sense of the word. Humans are obviously beings who have a *bios* aspect to their life, but we also have the *zoe*, the spiritual, aspect of life as well. When we understand this dual nature, in which we are, in CS Lewis’ words, “amphibians” (Lewis 1942) evolution loses its threatening affect. We understand that evolution is the story of how humans got the *bios* of their being, their biological life, and we understand that Scripture is the story of their *zoe* life. These are two different angles analyzing different aspects of the same thing, and when united, we see who we are meant to be as embodied souls. The physical realities in which we exist reflect the spiritual realities which we share in as well.

If the Scriptural fundamentalist is still not satisfied, we might examine Genesis 1:22, in which God orders the new biological life that God has just created to “be fruitful and multiply.” This commandment is another way of describing the driving force behind

evolution, the fittest are the individuals who are best at being fruitful and multiplying. God is oftentimes imagined as ordaining specific laws of the universe but people are cautious to carry this image on to biological principles. Here in Genesis, however, we see God explicitly ordering biological life to follow the guiding principle of evolution.

Far from being a contradiction to Scripture, evolution reflects the realities expressed by the Creation narrative, as long as we liberate the narrative from the confines of rigid literalism. In this way, evolution can inform and confirm faith in the Christian God rather than acting as a stumbling block to it.

#### Part IV: The Image of God

It is said that during an early debate over evolution, Samuel Wilberforce, the Bishop of Oxford, goaded a friend of Darwin's, the biologist Thomas Huxley, by asking which by which grandparent did he claim heritage as an ape? This is a common critique of evolutionary theory; that it denies the dignity of humanity. If we are nothing more than a particularly advanced ape, what does that make God if we are made in God's image? (Genesis 1:26) What can evolution teach us about our relationship to God if it does not insult that relationship?

Galileo addresses this concern in his *Letter to Casteli*, warning that strict adherence to literal interpretations of Scripture runs us into theological trouble.

One of these [failings] would be very serious and very frequent, namely, to want to limit oneself always to the literal meaning of the words; for there would emerge not only various contradictions but also serious heresies and blasphemies, and it would be necessary to attribute to God feet, hands, and eyes, as well as bodily and human feelings like anger, regret, hate, and sometimes even forgetfulness of things past and ignorance of future ones. (Galileo 1613)

We cram God into the confines of Creation when we insist that the way in which we resemble God is in our physical appearance, as if God were somehow contingent on Creation rather than the other way around.

Jesus describes the Kingdom of Heaven as a mustard seed (Matthew 13:31), a woman who has lost a coin (Luke 15:8), a vineyard (Matthew 20:1), a dragnet (Matthew 13:47), and yeast (Matthew 13:33). It is doubtful that the Prince of Heaven was very offended by describing his kingdom as a fungus, and it is equally absurd that humans should protest their own dignity more than the dignity of heaven.

St. Bernard of Clairvaux was once asked what the three greatest virtues were and he responded “Humility, humility, and humility.” (Novacosky 2010) If there is one thing that evolution can teach us about our relationship to God and Creation, it is humility. We are fragile beings in fragile bodies, closely related to all other life surrounding us. We have a unique capacity in Creation to develop technology that dramatically shapes the world in which we live and the similarly unique capacity to act with foresight. The natural conclusion given this position is to use our gifts thoughtfully. It is undeniable that we are different from the rest of Creation but it is dangerous for us to make the leap that because we are different, we are better than our fellow creatures (human or otherwise). Evolution is a constant reminder of our inextricable connectedness to the world around us, and I would argue that the record shows that humans are infinitely more needful of reminders to be humble than reminders that we are special.

The first sin was eating of the Tree of Knowledge, but eating in and of itself was not the sin. The sin was the desire to be like God, or pride. As a matter of fact, any sin can be followed down to an issue of pride. Lust is an expression of the underlying belief

one's sexual pleasure is more important than the dignity of another human being. Wrath is an expression of the belief that the injustice done to oneself is more significant than committing an equal or greater injustice against the perpetrator. Greed is the expression of the belief that one's own material wealth is of more importance than that of others. These all stem from a warped perception of self in relation to others and to God.

Pride pervades every level of human sin, so it stands to follow that humility is the antidote to that misplaced belief of self over all and science is one rich source of humility. Heliocentrism was so ardently opposed in Galileo's day because it was believed that to take Earth out of the center of the universe would be blasphemous. Today, there are few people, and they are far between, that have feel that their faith in God is challenged by the position of the sun. Carl Sagan, the great astronomer and champion of science, has called astronomy "a humbling and character-building experience," because of the perspective it imposes on its practitioners. (Sagan 1994) Evolutionary studies serve a similar purpose. The more we understand just how marvelous the processes that are responsible for the incredible diversity of life around us, the more we are struck by the majesty of it all. To understand that all the almost infinite complexity around us, the complexity that is behind something so common-place as a gentle spring breeze, is guided by simple basic principles, is to glimpse the mind of God.

Oftentimes people resist the idea of evolution because it either denies the exalted nature of humanity or because they feel that it lessens their awe of God. I invite those people to consider the eye, often held up by proponents of Intelligent Design as a counter-point to evolution by natural selection. Stare into the eyes of your lover and consider the fine contours of their iris, how their pupil gently contracts as it brings your

face into sharper focus. Dive into their eye and marvel at the lens upheld by a delicate scaffolding of muscles ready to adapt to the slightest variation in light. Look at the cone and rod cells lining the retina which interpret light energy into a chemical gradient that will convert your image into an electrical pulse traveling down cables of nerves to your brain, where it will be recognized by the minute details of your face, your specific jaw, the shape of your nose, and the color of your own eyes. This recognition will fire off countless other impulses to other parts of the brain, releasing hormones that redden your lover's cheeks at the sight of you, motor impulses that tug the corners of their mouth into a smile.

One way to interpret the existence of this organ is that it was crafted by the hands of a master artisan, skilled in the assembly of flesh and blood and nerves, to provide us with the marvel of sight. The other is to consider the history of the eye. Once again, imagine a skilled artisan, who chooses not to mold the eye from raw materials, but to imbue the raw materials themselves with the essence of the artisan and give them the chance to make something marvelous. Go back to the dawn of time, imagine all matter filling a formless void, expelled out by a Great Beginning (a Big Bang, if you will). The persistent tug of gravity begins to draw small bits of matter to one-another in a cosmic snowball effect that builds bigger and bigger masses until the matter is aggregated in clouds of dust. The pressure of all that mass pushing against itself causes fission reactions, spewing off heat and binding atoms of hydrogen into larger and larger molecules, capable of more and more complex reactions. Time passes and the furnace of the star begins to get unstable and it explodes, spilling heavy materials into the universe, where they had not existed until now.

Planets begin to form from these denser materials, with heavy substances like iron and nickel congregating in the center. These planets hurtle through space and pass near the pull of other stars, getting snagged by their gravity. The planets too near the star spiral into it like some cosmic whirlpool and those too far away continue on their way, not growing larger from lack of material. Those that are safely held by the pull of the star in orbit around it bask in the heat of the star and find themselves in prime real estate to pick up raw materials passing by, building diverse crusts and even some ice that will melt under the bombardment of radiation spilling off the star.

If the planet is at just the right distance from the star, the water will exist in its liquid state, in which it can dissolve minerals and chemicals from the diverse crust and form a complex solution. The radiation of the star continues to blast the planet, evaporating some of the water, moving it around as clouds and leaving it somewhere on land as rain. This constant mixing of molecules and solutions and the active forces of volcanoes and lightning all around produces something marvelous. Molecules form that can replicate and form marvelous shapes that can do incredible things.

These replicating molecules get embedded in balls of lipids that keep them contained and concentrated so they can replicate more efficiently. The addition of new molecules that can perform complex processes and the changes to the molecules that record how to make them begin to produce finely tuned machines that are better suited to survive in the environment every passing generation.

Skip ahead millions of years. Trial-and-error has produced thousands of different ways to reproduce and one organism experiences a mutation that localizes some cells that respond to light energy. This organism is better able to detect predators and navigate

because it can tell the difference between something so fundamental as light and dark. Countless organisms with countless ways of surviving have these light receptors, some are unrecognizable as descendants of the first ancient seer. More trial and error have resulted in organs that are remarkably efficient at detecting and interpreting information from light energy. They can focus the light spilling off shapes and even tell the difference between various wavelengths.

Organisms called humans step onto the stage after millions of years and have two of these organs in their heads. Some lucky ancestor far back in the distant past grew two light receptors and found that binocular vision improved depth perception, an incredible advantage over those that cannot. A mutation in a human living in the Caucasus Mountains prevents pigments from maturing in her iris, causing her eyes to shine with a blue disc. (Eiberg 2008) Generation after generation lives, loves, struggles, celebrates, and dies, and the chance encounters of humans ends in the person blushing across from you. A glance from their eyes carries the weight of the history of the universe—the drama of billions of years—and by some blessing beyond comprehension, they turn that gaze on you.

Both interpretations of the existence of the eye can bring glory to God, and importantly, neither of them deny glory to God. To consider the blessing that God gives us in the eyes of our beloved in the context of the eons and infinities that went into creating that moment is to bow in awe. If we understand the laws of the universe as the writ of God, we see the essence of the divine in everything around us. We can take absolutely nothing for granted around us when we consider the infinite complexity that led to its existence, we can only feel blessed and humbled to be a part of it.

It is a profound mistake to imagine that Christianity ever intended to dissipate the bewilderment and even the terror, the sense of our own nothingness, which come upon us when we think about the nature of things... Many a man, brought up in the glib profession of some shallow form of Christianity, who comes through reading Astronomy to realize for the first time how majestically indifferent most reality is to man, and who perhaps abandons his religion on that account, may at that moment be having his first genuinely religious experience. Christianity does not involve the belief that all things were made for man. It does involve the belief that God loves man and for his sake became man and died. I have not yet succeeded in seeing how what we know (and have known since the days of Ptolemy) about the size of the universe affects the credibility of this doctrine one way or the other. – CS Lewis, *Miracles*

Lewis just as well might be speaking of evolution. We are not meant to be comforted by the world around us, and it is good that its vastness and its indifference to us is unsettling. For the present discussion, suffice to say that humans have historically been in far greater danger of an inflated self-image than of humility. We are awfully proud of our intellect in comparison to the rest of Creation, but awfully slow to respond to the reality that we are nothing more than a mote of dust, uncomfortably related to much smaller, much less articulate, dust specks. All of us together hurling through an infinite void.

Though perhaps this is not enough. We are taught by Scripture that each human life is valuable so how is this reflected in evolution? To answer this, we turn to the fundamental unit of evolution: the gene. It is true that humans are limited, on an atomic level, to the same building blocks as literally everything else on earth. On a biochemical level, we know that the proteins we use to move electrons or facilitate cell division are largely the same as any other living thing. Genetically we are even uncomfortably similar to chimps and bananas. But on the level of nucleotides, the exact sequence of A's, T's, C's and G's, we are unique. Evolution necessitates a certain level of variation between individuals to come up with anything new, and because of this, guarantees a degree of



complete novelty in individuals. There remains the truth that species, despite being closely related to one-another, are still distinct. As John F. Haught says “The fact that we are informationally discontinuous with other kinds of life at least makes it conceivable that a theological affirmation of special human dignity poses no conflict with science.” (Haught 2010)

I have not forgotten the exception of identical twins, who share identical genomes. It would appear that this confidence in evolutionary individualism is misplaced if it falls apart in the face of a relatively commonplace occurrence. However, we know that genes alone do not determine such complex things as personalities and psyches. We have all met twins who could hardly be more different from one another in opinions and likes and unrelated friends who seem to share the same thoughts. It is clear with or without evolution that individuals are in fact individuals.

Evolution contains within it the physical parameters necessary for a belief in individualism not to stand in conflict with science. On the question of the human soul, like all science referring to all religious questions, evolution cannot make a statement in either direction. What it does do is remind us that while there are certain limitations put on us by genes and physical laws, we are not completely at the mercy of our genes. We have the capacity to choose what to believe and how to view the world. The most advantageous mutations might still be squashed from the gene pool by chance while adaptations that are not top of the line might persevere. Much of the outcome depends upon the actions of the individual.

## Part V: The Evolutionary Existential Crisis

If you ask one hundred different people what they think of the statement “we’re all going to die” you will likely get one hundred different responses. For some, the statement is an uncomfortable truth, the urgency of which challenges a life they might find mediocre. Others might look hopefully to the day they pass on as a release from the stresses and pains of the world. Still others might take it as a challenge to rail ferociously against the inevitability of their demise. For everyone, however, the inevitability of death raises a question about life: “what is it all for?”

One of the greatest fears that religious objectors to evolution hold is that a belief in evolution will lead inevitably to nihilism. Philosophically, there is no deeper meaning to derive from a strictly materialist universe and many are concerned by the potential ramifications that might derive from a belief in evolution instead of Special Creation. To this concern, I would remind the objector that materialism, like Christianity, requires a leap of faith that is not supported or opposed by scientific knowledge. Rather, that lack of explicit purpose imparted by Creation draws us beyond that Creation to find our purpose in the Creator. This is a clue left in Creation pointing us onward to God the closer we examine the Creation we are a part of.

It is however true that in the light of evolution our physical being alone does not imply an explicit spiritual purpose. In many ways, this proposal is a frightening one. That we are thrust into the world without an in-born motivation seems to fly in the face of the sentiment that “God has a plan” for us all. Conversely, it would be the height of presumption to assume that God’s plan is dependent upon our participation. It is true that we have many gifts incorporated into the Body of Christ (1 Corinth. 12) but we overstep

ourselves to believe that God requires our cooperation to accomplish God's ends. As Joseph said to his brothers: "Do not be afraid! Am I in the place of God? Even though you intended to do harm to me, God intended it for good, in order to preserve a numerous people, as he is doing today." (Genesis 50:19-20)

It is our ability to choose to be a part of God's plan that is the crucial thing. We may indeed choose to believe that the physical realities around us are all that reality is, that we are slaves to the most horrific form of determinism—the illusion of free will created by minds that are incapable of perceiving the events that resulted in every thought ever considered original. We also may choose to see our ability to choose one way or another, in spite of understanding all the influences on our decision making, as a truly free action. As Ian Barbour says, "Even the philosopher or scientist who defends determinism assumes in daily life that other people are responsible for their actions." (Barbour 2002)

It may be that someday we will be able to map thoughts and interpret electrical impulses and chemical exchanges into the coherent thoughts they orchestrate, but this does not preclude the possibility of a soul existing in a plane of existence we are unable to measure. Nor does our inability to do so now "prove" that a soul does exist. The best science can say is 'whether or not the soul is behind the thought, this is what happens when thought happens.' This very inability of science to answer by experimental demonstration all of the questions it wants to understand encourages the scientist to continue searching for answers. As we approach the limits of what analytical knowledge can provide for us, the curiosity that got us there invites us into contemplative thought and into the divine mystery. Similarly when the knowledge imparted by religion falls

short of explicit instructions of how to heal others or be stewards of Creation we are drawn into the realm of science and experimentation.

This is why we do ourselves a disservice when we consider our way of thinking to be predetermined. The Christian faith is full of challenges to think differently. Paul tells us in 1 Corinthians that “God chose what is foolish in the world to shame the wise; God chose what is weak in the world to shame the strong;” (1Corinth. 1:27) and as we saw above, Jesus tells his disciples that he teaches in parables because “‘this people’s heart has grown dull, and their ears are hard of hearing, and they have shut their eyes; so that they might not look with their eyes and listen with their ears, and understand with their heart and turn—and I would heal them.’” The disciples are blessed because they see and hear rightly. (John 13:15-17) David Foster Wallace, a secular thinker, argues that we are invited into the opportunity to look beyond the apparent toward the reality beyond the obvious. (Wallace 2005) This capacity is largely what defines our lives.

As has been said, humans have dual natures that are not entirely separable from one another. We are embodied souls, saints and sinners, masters of creation and servants of us, creatures that are born and that will die. The inevitability of death is contrasted by the wild possibility of our birth. Hannah Arendt speaks of humans as living embodiments of potential. “Since we all come into the world by virtue of our birth, as newcomers and beginnings, we are able to start something new; without the fact of birth we would not even know what novelty is.” (Arendt 1969) We are born with the ability to act, in Arendt’s system, this is much more than simply doing things. If it were not for our ability to act everything else would be “mere behavior or preservation.” (Arendt 1969) The only

fitting reality to pair this potential in birth is a reality in which we are free to choose how to exercise this ability.

Barbour highlights that the Bible reflects this reality of moral choice. “Choose this day whom you will serve” (Josh. 24:15) “For I do not the good that I want, the evil I do not want is what I do” (Rom. 7:19) “No one can serve two masters” (Luke 16:13). Adam and Eve faced a choice, as do we all, to follow God’s will instead of our own. This ability to choose, to observe nuance in the world is what allows love to be possible and free will to exist.

This nuance is in fact what allows us to answer the existential question of nature. We are able, in the words of Wallace, to “choose what to believe.” (Wallace 2005) This is a crucial part of free will. We are not forced by God to believe in Christian doctrine or any other doctrine for that matter. If we were able to demonstrate empirically that the universe snapped into existence, more or less as we see it today, somewhere around 6,000 years ago by the action of a divine being, we would be forced to believe in the existence of that being, but this would not be freedom of belief. We again come to the truth that science can show what happens and how but it cannot comment on any other aspect of reality. The belief that God created and the belief that evolution is the mode by which God chose to do so are not mutually exclusive.

Our scientific model of the universe is necessary for freedom of choice to exist if we accept the doctrine of souls. CS Lewis observes “So it is with the life of souls in a world: fixed laws, consequences unfolding by causal necessity, the whole natural order are at once limits within which their common life is confined and also the sole condition under which any such life is possible.” (Lewis 1940) Evolution provides the context in

which a proclamation of faith is meaningful, that is to say, salvation would not be possible without the physical realities around us, including evolution.

“Therefore, since we are justified by faith, we have peace with God through our Lord Jesus Christ, through whom we have obtained access to this grace in which we stand,” says Paul in Romans 5:1-2. If we are not wholly free to accept or deny the message of the Gospel, we cannot be justified by faith. Jesus admonishes the crowds who demand a sign of his power. (Luke 11:29) He knows that true faith does not come from seeing, but from believing. (John 20:29) Knowing that we are created by natural processes, rather than a snap of the Divine Fingers, leaves us the freedom to choose God from the revelation God provides.

#### Part VI: Red in Tooth and Claw

What is to be made of the violence in an evolutionary system? Surely a loving God could not establish a system in which every living thing must struggle, one against the other, for survival. If nature is, as Tennyson has said, “red in tooth and claw,” where does that leave our notion of a loving God? (Tennyson 1833) In other words, how does evolution reconcile itself with theodicy?

I hope that it is obvious that organisms compete for limited resources whether they exist as a result of evolution or of Special Creation. The question of theodicy is as old as the concept of a loving God. Lewis points out that “an inference from the course of events in this world to the goodness and wisdom of the Creator would have been [clearly] preposterous; and it was never made.” (Lewis 1940) Humans did not derive a concept of a good and just God from nature, and if any people were to do so, it would not have been

the Jews, whose history is filled with suffering. And yet Christians and Jews believe in a God with the audacity to speak into a world—created by the same God—that features myriad horrifying ways to die with the claim ‘I love you.’ Faith has been challenged by the problem of pain since long before Darwin set foot on the *Beagle*.

Lewis’ work *The Problem of Pain* centers not on an idea that pain is actually good but that the *possibility* of pain is necessary. He does not say that God enjoys watching us in pain, nor that God would call pain a strictly good thing, but it must be, at the very least, possible, and at the most, useful. Freedom would not be possible if there were not equal potential to act poorly as to act well. “[If] souls are free, they cannot be prevented from dealing with the problem [of limited resources] by completion instead of courtesy. And once they have advanced to actual hostility, they can exploit the fixed state of matter to hurt one another.” (Lewis 1940) Lewis provides the proof that for any sentient being to recognize itself as ‘self’, there must be an ‘other’ against which to compare itself—whether that encounter be human-perceives-God, human-perceives-human. A neutral environment must exist for this to happen, in which both parties are equally free to manipulate the world around them to communicate (it would not do for me to try and speak if my collocutor decided air should not move). This environment must be at least mostly permanent for any attempt at communicating, and the nature of that permanence and the ability of each being to manipulate it means that “the permanent nature of wood which enables us to use it as a beam also enables us to use it for hitting our neighbor on the head.” (Lewis 1940)

Nature necessitates the capacity for wood to hurt when applied vigorously to the forehead, for skin to burn when accidentally placed on a stove burner, and for viruses to

lyse cells when reproducing. We need not be happy about any of these things, but we also must not disdain them. Wood makes poor building material if it is not hard and strong, stove burners need to be hot to cook food, and the same evolutionary processes that allow for the possibility of flowers and songbirds are the processes that allow for the possibility of viruses and bacteria and parasites.

Now, the Christian belief is that God can intervene in the environment as it is of God's making. This is called a miracle. However, God could not intervene excessively or we would lose our ability to apply our will to the world around us. If the world were constantly being formed according to the changing whims of some non-committal being, we would not be able to be in relationship with that being, much less with anyone else, and by extent, ourselves. That the laws of nature dictate the structure of the world allows us to exist in it as thinking beings at all.

Ian Barbour affirms this view that the possibility and existence of pain is a metaphysical necessity, not the result of divine laziness on the part of a God that could not be bothered to come up with a "better" system. He rejects Irenaeus' model that describes the world's suffering as an arena of soul-making. "How would we view a human father," he asks, "who withheld measures that could have prevented the protracted suffering of a person with AIDS or a prisoner at Auschwitz?" After all, suffering can produce strength in some, but it can destroy others. (Barbour 2002) We reach a logical impasse when we try to orient the conception of an all-loving God with a God that specifically created everything. If God deliberately created every living thing, that necessarily includes everything from petunias to pertussis. If someone punches someone else in the face and says you're welcome, it is an abusive relationship. If they have the



audacity to follow it up with “I love you” or “That was to teach you a lesson,” that person is cruel. We are forced to choose between a God that is loving and a God that uses.

The relationship of God to creation can be reflected, then, in evolution. It is necessary for evolution to function that “errors” be possible in replicating DNA, translating genes into gene products, and in producing gametes. These variations are carefully controlled by complex cellular proofreading processes but the events in which mistakes can be made are so common that statistically, mistakes will be made. These mistakes can do marvelous things and produce new proteins, new structures, provide more control, perform more efficiently, and over time as they accumulate they lead to speciation. Strictly speaking, gazelles and crocuses are the results of many millions of compounded “mistakes” in the original genetic code. If we were to regulate the genome to the point that no change would be possible, life would not be able to adapt. There would be no bouquets or forests or coral reefs or penguins or grizzly bears.

This same capacity to allow adaptation and speciation and improvement allows the possibility of disease. Cancer is a mutation in specific genes that control cell division. Genetic diseases are mutations that affect major cellular processes. The viruses, bacteria, fungi, and parasites that cause sicknesses occupy ecological niches that are just as viable as the plants and animals that provide our food. If any life is to exist, all life must be able to exist, whether we happen to like it or not. This is not meant to be a comforting thought, nor do I expect anyone to be grateful for Alzheimer’s Disease. Jesus was not grateful for the cross. He carried it though, knowing that love is greater than suffering, and in suffering he redeemed.

It is true that people can choose to do bad things and that wood is an effective club and that suffering is a consequence of polio's nature, but the Bible is full of calls to rise above these realities. The beautiful thing about our intelligence is that it allows us to solve problems and the beautiful thing about our soul is that we can see the problems that need to be solved. Jesus gave his disciples the power to give sight to the blind and to heal the lame. In our world, with cataract surgeries and physical therapy, the way we heal may have changed but the order to heal the sick stands.

In many ways, the story of evolution parallels the story of salvation. God did not specifically intend for either sin or disease, but their potential was necessary for the universe to be created at all. People chose sin and it is through the same mechanism of choice that permitted the Fall that Jesus saved the world by voluntarily taking on death on behalf of the world. There was nothing that required Jesus to sacrifice himself for us other than his own freely made choice. Similarly, the same mechanism that resulted in disease developed an intellect that can choose to alter "the way things are". It is by choice that Jesus saved the world and it is by evolution that we find ourselves able to follow his commandments.

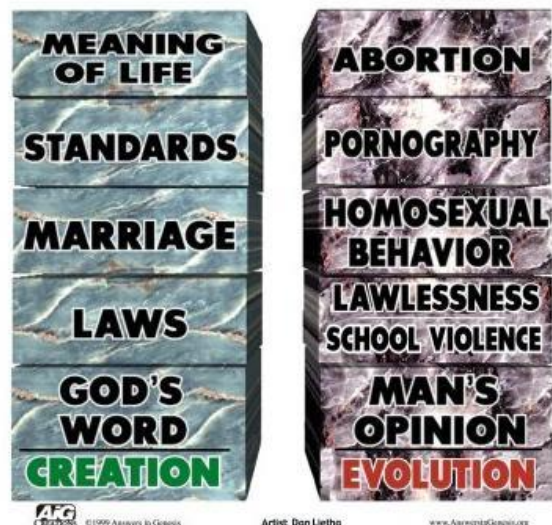
Evolution, for humanity, has resulted in our intellect, a light against the darkness of suffering and pain—our ability to resist and over-come the challenges posed by the world. Our brains are, to date, the most complex physical things we have encountered in the universe, and they give us the capacity, unique in nature, to change the world in which we live on a massive scale. (Garrett 2014) We can partner with the forces of nature to change the world in lasting and far-reaching ways, which allows us to consistently make the world a better, more livable place. Since 1990, the Bill and Melinda Gates

Foundation reports 122 million children’s lives have been saved by world-wide philanthropy and advances in science. Vaccine coverage is higher than at any point in history, Rwanda cut its infant mortality rate by 30% between 2008 and 2015, and extreme poverty has been cut in half in the last 25 years. (Gates Foundation 2017) This is no accident. This is the power of the human mind and the human spirit acting in concert with one another. There is no reason to believe that the power of our minds, honed by evolution, is not at the same time a gift from God.

### Part VII: The Materialist Specter

This section will be the shortest as it addresses the concern regarding evolution that is easiest to confront. As shown in the image to the right, published by Answers in Genesis, a Young Earth Creationist advocacy group, there are certain ethical concerns about what will happen if evolution is accepted. Leaving aside the logical leaps required to move from “marriage” to “standards” to “meaning of life”, much less from “school violence” to “homosexual behavior”, the general philosophical concern with the theory of evolution is that it promotes a philosophy of materialism.

Materialism, as mentioned above, is the metaphysical belief that matter is the end of the story when it comes to reality. The concern raised by opponents of materialist thought is that it does not promote ethical life and is in opposition to religious life. Opponents of evolution fear that teaching



evolution (or scientific theory in general) will influence people to accept materialism. This fear stems from science's employment of utilitarian materialism. It is not the project of science to dip into the immaterial or unmeasurable. The limitation of science as far as making metaphysical or religious claims is often interpreted as a rejection of metaphysical or religious realities.

This idea of science is a misinterpretation of the goals. Science, properly done, has only ever attempted to describe and understand the physical world. The dismissal of the notion that thunder is an expression of divine anger comes from an understanding of what thunder actually is, and is not a dismissal of the concept of God in general. There is a logical fallacy that is committed by both sides of the issue that presents the advance of science as encroaching on the realm of the divine. The God portrayed here is the so-called God of the Gaps, filling in for knowledge where we happen to lack an explanation for a phenomenon. Materialists see God as a flimsy placeholder for lazy thinkers who cannot grasp the reality in front of them while religious opponents of science believe they are protecting God from an insidious plot to breed disbelief.

Both sides, however, are being undeniably ridiculous. If God exists, there can be no part of the universe not imprinted by God's presence. How, exactly, might someone control for an act of God in their experimental design? The best replicates can do is rule out a half-hearted intervention by God, but they cannot control for a particularly dedicated trickster deliberately foiling every measurement. Likewise, if God exists, what is there in all of Creation that can threaten God? It is a flimsy, self-conscious and petty God that would demand that its creation deliberately ignore what they can show repeatedly and rigorously to be true. It is against the very nature of the Christian

conception of God to be such, and it is doubtful that any Christian would worship a God with such little self-confidence as to plant tests in the Creation that same God called “very good”, to test the loyalty of its inhabitants. (Gen. 1:31)

Materialism is in no way a recent phenomenon and it is far from confirmed by evolution. The same set of facts can be used to support either worldview while confirming neither of them. The marvelous diversity of life, as a result of evolution, will inspire awe of a creative God who ordained natural laws in the theist and will impress the materialist with the power of those same natural laws. The stars at night will make anyone feel small, but the theist will reflect on how small they are before the universe and its Creator and be humbled by that feeling, while the Materialist will reflect on how small they are before the Universe and its uncaring and be humbled by that feeling as well. People have done horrific things in the name of religion and equally horrible things believing morality to be a construct. Morality is not an inevitable derivative of metaphysics because people are rarely philosophically consistent in the day-to-day; morality is a system that each person must buy into for themselves. Materialism no more supports moral relativism than Confucianism supports the Zodiac Killer, they only sound similar.

It has been said enough above that it hardly bears repeating here, but science cannot confirm nor deny religious nor metaphysical claims. The best it can do is encourage to challenge their perspective, which is in no way opposed to the idea of faith. It is a weak faith indeed that fears to ask questions. To continue to uphold it the idea of faith and science as fundamentally oppositional is philosophically dishonest.

Science should not frighten a religious person. It is our best practical way to rise to the call of Christ to serve the poor. It does not diminish awe in the presence of the Creator, but rather reflects the reality of the Creator. The divine paradox of a being that is, simply put, all-powerful, all-knowing, and all loving, as well as infinite, and beyond full comprehension is paralleled by a physical reality that is governed by a few simple laws with infinitely complex consequences. “All the earth worships you; they sing praises to you, sing praises to your name” says the Psalmist, (Psalm 66:4) and we ought to join in their song.

#### Part VIII: Conclusion

For too long, God and Creation have been artificially placed on opposite sides of an imagined divide. When they are united, God shining through Creation and Creation pointing to God, we see the universe in a different light. The theory of evolution is the most powerful conceptual tool in our understanding of biology and it is foolish to cling to spiritual blindness simply for fear of what one might find if one examines one's faith. Jesus commands Peter to set out into the deep and cast his nets and we would be remiss not to do the same. (Luke 5:4)

Evolution, far from being some demonic plot to overthrow the Lord's claim on our hearts, is in fact useful in understanding God on a more profound level. Reading Genesis in the light of evolutionary theory, we are reminded of how little we can claim for our own. We are beings that embody a dual nature of being able to harness nature while carrying the responsibility to care for it, as we are inextricably linked to the rest of Creation. We are unburdened by the contradictions of the Creation narratives and instead

see ourselves in relationship to God and Creation in a new way. We are reminded that, for all the pain in the world, this world is “very good” and will be if we fully accept our participation and responsibility in it.

We are taught humility by the knowledge that we are made of dust and to dust we shall return—as much as we are able to master creation we are made of it. When we confront the vastness of the world we are pointed to the divine and marvel at the complexity of it all. God’s love is made all the more incredible when we understand just how long the work goes back that we might have the capacity to savor the taste of a good meal or delight in the company of a friend. God’s grace made more amazing by the knowledge that we are neither the center of the universe or particularly special on the sliver of dust we call home, and yet God loves us each individually enough to die for us. It is well that we cannot deduce our meaning from the physical nature of the world, else we might believe that we are made somehow for it or it for us. Creation exists, not for the benefit of any particular part of it, but for the Creator.

If we are to be capable of loving, we cannot be made like wound-up toys or dolls that cry “I love you” whenever prompted. It must be a freely made choice. For physical beings, only in a world bound by strict physical parameters, is this choice possible. As Lewis points out above, “fixed laws, consequences unfolding by causal necessity, the whole natural order are at once limits within [our] common life is confined and also the sole condition under which any such life is possible.” (Lewis 1940) Further, the salvation story is reflected by the story of evolution. The redemption of humanity by Christ was made by the same faculty of choice that led to its fall in the first place and the adaptive

ability of humans to push back against the suffering of the physical world is realized by harnessing the properties of that physical world.

Even the problem of pain in God's creation is reflected in the evolutionary process in that the same processes that make organisms more fruitful and better at multiplying over time open them up to disease and disabilities. The same choice and creative energy that allows people to build Auschwitz can just as easily be used to build cathedrals or to paint masterpieces, and it is the malleability of the genetic code that makes cancer possible that is responsible for all the awesome and beautiful diversity of life that we share our world with. This is a reflection of the reality of choice that makes sin possible, and whose fruits we reap all around us. As was said above, in order for any life to exist, it all must be able to exist.

Fears of what evolution might do to our relationship with God come from the same place as fears of what sex or food might do. Sex and food and evolution are good until they are misused, the same as everything else in Creation. Any slippery-slope doomsday images of a Godless future are no more relevant to a discussion of evolution than they are to a discussion of where the Earth sits in the solar system. It is the job of religious leaders and the faithful to break down a false dichotomy that might drive people from the faith, and instead to invite them in.

Evolution is a reality of nature that reflects the Creator if we have the courage to look, but too much fear has dominated the dialogue between religious and scientific communities. We have torn apart the Book of Scripture from the Book of Nature. We are left with a sort of religious and philosophical myopathy when we insist on using one lens to view the world to the exclusion of the other. If God is God, questions and



understanding are not objects of fear, but invitations into life lived fully, through every aspect of it. Religion tells us the way we relate to God and one-another and what we should do while science tells us how to do it. Neither of these ends excludes the other, and oftentimes they are improved by one another. We cannot love our neighbor until we recognize them. We cannot love God if we do not search for God in everything we do. We cannot feed the Lord's sheep if we do not know how, so let us begin.

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