

The Gravity of Creation

An Essay on the Convergence of Scientific Knowledge and Biblical Wisdom

Introduction

There are a number of questions that trouble me; difficult yet interesting, compelling yet frustrating – these questions demand answers, as they directly affect how I view the world and every person with whom I have contact. If I should choose a single word to frame the context of my seeking, it would be “purpose”. More specifically, do I have one? Do you? If so, is it God-given and inspired? Is there a natural, directed or bounded purpose to all of creation? Alternatively, are the evolutionists correct in their estimation that we are here by chance – a random evolved mutation of some happenstance murky ooze that congealed in the newly warmed waters 3.8 billion years ago and swelled slowly to become our pseudo-evolved nature?

Of course, the question of purpose is timeless – an enigma well beyond my ability to confront. However, keeping purpose in mind, I can narrow the scope of discovery to ideas and concepts that are more manageable, simplify and distill the larger question into its constituent parts and begin to think-through as many as possible to help substantiate what I already believe. Yes, I already hold a belief, and it is that there was a creation guided by the hand of a Creator, who began with an idea and established this creation with a purpose designed to serve His idea. Following this line of thinking, is there any tangible or compelling evidence that our reality is purposefully and intelligently created? In fact, in many years of wrestling with this question, I have discovered more conflict and contradiction than anything. As an amateur naturalist (defined specifically as one who studies all aspects of nature and the physical world), and a devout believer in a loving Creator, I embrace every opportunity for dialog on any aspect of creation, whether biblical, scientific, or any ambiguous space between. Ultimately, mine is a search for truth, and this search is problematic. Let me explain.

The Bible Problem

I am a Christian. I believe in God. More than a simple belief, I experience God in my life. To me, God is equally as tangible as He is putative. However, being both curious and diligent and at some reasonable level a student of the Bible, I come to find that the Bible raises more questions than it answers. The closer I read God’s written word, the less confident I am in my understanding of nature. How can this be? If God created nature (the heavens and the earth and everything in-between), how can a study of God’s word raise conflict and infer contradiction? Is God’s word true or is it not? Is the Bible truly God’s written word provided to His creation, or is it a compilation of stories and fables handed-down through time – no better or worse than the Greek mythology?

This is about a belief in God and a belief that the Bible represents God’s word provided to His creation to teach, inform, illustrate, and educate – to help us develop, grow and mature – and ultimately to enhance our understanding of who He is, who we are, and what our purpose is as physical earthly beings. This is also about science, and our ever-expanding understanding of the constructs of the universe within which we live. From the scientific standpoint, this is really about nature and the rules that govern how the universe functions at the largest (cosmic) and the smallest (quantum) scale.

We have learned much about the ‘nature of nature’ over the past century, and much of our new understanding directly or indirectly contradicts the language and information as presented in the Bible. Therefore, I question which is correct, sensing as many do that the conflicts are real, unexplainable and irreconcilable. I find that the majority of people I speak with believe in either scientific knowledge or biblical wisdom, but not both. Most believe that science and the Bible represent a dichotomy and are mutually exclusive. Some fraction more believe that the Bible is (present tense) God’s word, but was (past tense) intended for lesser-enlightened early populations, and subsequently no longer relevant now that we’ve evolved a higher-order scientific mind.

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Therefore, I study the sciences with hope that a deeper understanding will provide clarity. Two years ago I looked at the various scientific disciplines that have driven the deepest wedges between my faith and my understandings of nature, then endeavored to acquire a deeper knowledge of these topics. Over the past two years I've studied Einstein's *special and general relativity* (time dilation, gravity and the fabric of space-time), general *cosmology* (the big bang, black holes, and current thinking on the expansion/contraction of our universe), *Newton's laws* of gravitational attraction (essentially the classical physics surrounding gravitation up through the introduction of relativity), and *quantum mechanics* (particle physics, string theory, entanglement, and wave/particle duality).

In addition, I've studied some of the work that's been done to track the progress and viability of the (Darwinian) evolutionary model coupled with the current research and findings on the fossil record, and how current findings agree (or disagree) with everything else we've discovered about creation and the progression of life through time.

And so I also continue my study of God's word with hope for supplementary (and complimentary) understanding. Granted, two years is barely enough time to scratch the surface of the scientific topics identified, but it's been enough time to provide some refreshing (and sometimes startling!) new insights and perceptions into how God's description of the creation (Genesis 1:1-12) aligns closely with what science tells us about the properties and qualities of nature. Thus, in two short years, I've come to the following conclusion:

"I disagree with the dissenting positions regarding the origin of the Bible and it's relevance, and that science and the Bible are dichotomous. Not only is the Bible true, it represents an essential and complimentary duality with scientific knowledge. In other words, both are correct, but have differing explanatory position, perspective and purpose." The following text is meant to shed light on how scientific knowledge and biblical wisdom converge to paint an accurate picture of nature, and how these two (seemingly) opposing perspectives can co-exist to provide the most complete understanding of God's creation.

The Perception Problem

Above, I state that most people either believe in science or the Bible but not both. I also state that many people believe that God did inspire the biblical writings, but that these writings were meant for lesser intellects and that we've now evolved and matured beyond the need for this ancient guidance. Interestingly, most of the believers (independent of any specific or organized religious affiliation) I've talked to understand the scientific viewpoints and principles at an extremely low level. Similarly, the people with the greatest scientific slant understand the Bible at an extremely low level. The problem is that without an understanding at even the most remedial levels a person's beliefs are founded predominately upon perception and intuition, or even sometimes people believe what they believe simply because they've been told or taught to.

Troubling Questions

I began this paper by stating that I'm troubled by questions that demand answers. While the list is long and some of the questions technically involved, I'm prepared within the context of this work to offer a short list of some of the more troubling questions, and the ones I'll begin targeting in this and follow-on bodies of work. (Warning to the reader: I may, as I deem convenient, intersperse more questions into the stream of work when and where I feel relationships may exist.)

- Genesis reads that God created the heavens and the earth in 6 days. Is this a literal reading? Many believe it is, as are the rest of the biblical teachings. We now know scientifically that the universe is between 13.7 and 15.5 billion years old (two schools of thought not covered in this paper). How do we reconcile this apparent contradiction?

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- A literal reading of the generational genealogy of Adam and his ancestry indicates that “man” is approximately 6,000 years old. On the other hand, the fossil record proves that man and all other life forms (plant life included) are several hundred million to several billions of years old. Clearly the fossil record is void of proof in support of classical Darwinian evolution (as Darwin himself made clear but Huxley ignored), but there is adequate and compelling evidence that the 6,000 year figure is short by many orders of magnitude.
- Again, a literal reading of Genesis indicates that Adam and Eve spawned Cain and Abel, Cain then murdered Abel whereby Cain was summarily banished, and (according to the Bible) traveled to a distant land, got married and started his own family. To whom was he married?
- There has been and remains ongoing, a tremendous debate on the issue of evolution and the obvious contradictions between the fossil record and the biblical dynamic and timeline of creation. What of the dinosaurs? Does the Bible mention this aspect of nature’s progression through the creation or evolution of species? To the contrary, how would an evolutionist explain the staccato nature of life’s development, and the convincing evidence that life started immediately after the formation of water some 3.8 billion years ago?
- And what of the fossil record itself, which has been shown to contradict the evolutionary model more than it supports this theory. There are numerous and severe problems with the Darwinian model, such that few scientists still support the model as originally put-forth by Darwin and aggressively promoted by Huxley.

These are but a few of the problems that face the active Christian and practicing scientist (amateur or otherwise) who seek to find convergence between biblical wisdom and scientific knowledge. It is my contention that these questions can be adequately addressed and satisfactorily answered through a deep study of both mediums. I don’t pretend to promote factual answers to these tough questions, but rather to offer-up ideas compelling enough to promote thoughtful consideration of how these two separate mediums describe the same natural truth.

In this first paper addressing these questions, I’ll begin with the first problem listed above – how the known age of our universe (approximately 15.5 billion years), coupled with what we know scientifically about the creation, expansion and evolution of our universe (the Big Bang) and the biblical description of the 6 days that it took God to effect the creation can legitimately describe the exact same events and timelines. In other words, how the biblical Genesis description can be reconciled with our scientific understanding and knowledge of the creation, expansion and age of the universe. To start, we’ll look at how, specifically, each school describes creation events.

What Science Says...

According to the scientific community, the universe began when a microscopic single entity of matter exploded. This entity (size unknown, but current string theorists believe it was the size of a quantity known as the Planck Length – more on this later), was believed to have an infinite mass with infinite gravitational strength. Now widely known as the Big Bang, science believes that our current reality is the product of this explosion and subsequent expansion of the materials contained within. The chain of events that flow from the big bang to the current material composition of our universe are as follows (please accept the abbreviated descriptions provided below as representing current scientific thinking – a more granular treatment of the specifics associated with each phase of the expansion is beyond the scope of this paper but easily verified):

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- 15.75 billion years ago - Big Bang – quark confinement - light literally breaks free as electrons bond to atomic nuclei – galaxies start to form.
- 7.75 billion years ago - disk of Milky Way forms (along with all other galaxies) – our sun, a main sequence star, forms.
- 3.75 billion years ago - the earth cools and liquid water appears – first life, bacteria and photosynthetic algae, appears almost immediately after the first appearance of water.
- 1.75 billion years ago - Earth's atmosphere becomes transparent – photosynthesis produces oxygen-rich atmosphere.
- 750 million years ago – first multi-cellular animals – waters swarm with animal life having the basic body plans of all future animals – winged insects appear.
- 250 million years ago – mass extinction destroys 90% of all life – land is repopulated with hominids then humans.

This is the current, most widely-accepted scientific explanation for the origin, expansion and development of our universe based upon cosmological, geological, archeological and paleontological evidence. Now let's see what the Bible reports.

What the Bible says...

The first part of the first book in the Old Testament, Genesis, describes how God created the heavens and the earth (and everything contained within). The explanatory flow is as follows (as above, please accept the abbreviated descriptions provided below as representing biblical record; although most of my training is with the westernized two-testament Bible, I've drawn the summary record below from the original Hebrew Torah and Kabalistic Talmud records, and aligned them to ensure accuracy with the standard King James Genesis records):

- Day 1 – the creation of the universe – light separates from dark (Genesis 1:1-5).
- Day 2 – the heavenly firmament forms (Genesis 1:6-8).
- Day 3 – oceans and dry land appear – the first life, plants, appear (Genesis 1:9-13) – plant life continued to develop over the following days.
- Day 4 – the sun, moon and stars become visible in the heavens (Genesis 1:14-19).
- Day 5 – the first animal life swarms abundantly in the waters – reptiles and winged animals appear (Genesis 1:20-23).
- Day 6 – land animals and mammals appear – humans appear (Genesis 1:24-31).

Now that we have a high-level summary of events as recorded both scientifically and biblically, let's overlay both records to see and appreciate a remarkable agreement and consistency in how our universe developed. Table 1 below aligns the two descriptions.

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Day number	Start of day *	End of day *	Bible record	Scientific record
1	15.750	7.750	the creation of the universe – light separates from dark	Big Bang – quark confinement - light literally breaks free as electrons bond to atomic nuclei – galaxies start to form
2	7.750	3.750	the heavenly firmament forms	disk of Milky Way forms (along with all other galaxies) – our sun, a main sequence star, forms
3	3.750	1.750	oceans and dry land appear – the first life, plants, appears	the earth cools and liquid water appears – first life, bacteria and photosynthetic algae, appears almost immediately after the first appearance of water
4	1.750	.750	sun, moon and stars become visible in the heavens	Earth's atmosphere becomes transparent – photosynthesis produces oxygen-rich atmosphere
5	.750	.250	first animal life swarms in the waters – reptiles and winged animals appear	first multi-cellular animals – waters swarm with animal life having the basic body plans of all future animals – winged insects appear
6	.250	approx. 6000 yrs ago	land animals and mammals appear – humans appear	mass extinction destroys 90% of all life – land is repopulated with hominids then humans

* time period is stated in billions of years starting from the big bang event through current time.

Table 1: Biblical and Scientific description and timeline of events

Can this be true? Can it be that science has, through disciplined research, trial and error and brilliant discovery, substantiated what the Bible reported and described several thousand years ago? I believe that this is indeed an accurate representation of the creation and development of our universe from both standpoints. The only (and most troubling) conflict from the table above is the clear discrepancy between the time scales – once again, is it 6 days or is it 15 billion years? Is it possible to reconcile this aspect of the story? I believe that it is – so let's dig in a little deeper.

It's all Relative to Me

In the past two years of study, everything I've looked at and thought about (related to the topic of biblical time versus scientific time) seems to point back to the nature of gravity as the underlying force that binds together all elemental and component natural structures (time included). In digest:

- Isaac Newton developed a theory of gravity that stood as law for several hundred years. Newton provided mathematical and experimental proof for his findings, and where the mathematics were deficient or non-existent, developed the mathematical constructs and formulization to support his beliefs and findings. His contributions to the sciences and mathematics are unparalleled in history.

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- Newton's laws were widely held as fact, but he himself acknowledged that there were problems with his gravitational theories and admitted a void of understanding as to the exact nature of the force. Even though Newton identified the fundamental force and provided a plethora of supporting collateral about how it worked (through both practical application and mathematical calculation), he admitted to having no understanding *whatsoever* as to what Gravity actually was. Ultimately, Newton believed that there must be some unseen "agent" acting on behalf of gravity to facilitate the associated and measurable forces and effects.
- Enter Albert Einstein - in 1905 at the age of 26 working as a patent clerk in Bern Switzerland, Einstein developed a radical new theory that resolved some of the more troubling aspects of classical Newtonian physics. One of the most significant was with respect to Newton's belief (defended mathematically) that a change in a body's gravitational configuration was immediately felt by (or, had an instantaneous impact on, or, caused an instantaneous change in) all other bodies in gravitational relationship with the original body. Einstein redefined our understanding of gravity by proving that 1) the speed of light is a constant value (300 million meters/second, or 176,000 feet/second, or 670 million miles per hour), and that 2) nothing travels faster than the speed of light. This "refinement" of classical physics (Newton had it mostly right) had broad implications for science and physics across the board, as we'll discuss later.
- Einstein's principle of special relativity was the revolutionary construct that redefined our views of space and time (essentially showing that space and time were not independent and fixed as Galileo and Newton proposed, but rather singly intertwined and interdependent) and was the mechanism that transformed our fundamental understanding of gravity. Special Relativity is one of the keys to solving our problem, and will be discussed in more detail as we move forward. Although special relativity is an exceedingly deep topic that covers a lot of technical ground (conceptually, theoretically and mathematically), the most basic premise is with respect to time, and our perceptions of motion and the passage of time based upon our relative position (our observational viewpoint relative to the object we are observing). So in essence, it's about the relative relationship between the observer and the observed.

Relativistic Time Dilation

In this next section I'll begin to flesh-out some of the more important aspects of relativity, gravity and time dilation as they relate to the topic at hand. These are complex and non-intuitive ideas, so bear with me as I attempt to explain the concepts; I'll try and provide analogies and examples as much as possible such that the reader can relate the concept with how we experience our world. The following short paragraphs are meant to introduce the concepts, and as such are presented at a moderately high level. Further expansion of each concept is provided later in the text as we drive closer to identifying the areas of convergence.

Special relativity is the mathematical and experimental proof that the same single event can be viewed (experienced) differently by separate observers. There's a massive body of published work available that describes special relativity, and while most of it is well presented, this theory is profoundly difficult to understand and internalize. The core reason is that the effects of relativity only become apparent as one approaches the speed of light. We, as surveyors of events, experience all that we observe at a infinitesimal fraction of this speed – a fraction so small as to be insignificant or irrelevant from the context of perceiving any effect on time.

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Time, as Einstein so elegantly proved, is not a constant. Time is a flexible and variable mechanism used to measure the duration between events, and is subject to alteration and adjustment based upon the direct and specific set of properties surrounding the event. Because we as observers experience time within a small window of its variability potential, it's very difficult to grasp the concept of time not being a constant; we experience time in a fixed form from the instant we are born to the moment we expire. The base properties that affect time are gravity and speed – both causing and allowing for time to accelerate or slow contingent upon the involved relationships. For instance, the strength of a gravitational field can speed-up or slow-down time as it is measured by observers *within the same reference frame*. The concept of the reference frame is important to the discussion, so I'll expand the idea further.

Framing Your Point of Reference

An individual's reference frame, typically associated with motion, is defined as their specific observational viewpoint along with everything around them that shares that same viewpoint. For example, when riding in a moving automobile, you, the car, the other passengers, and everything else contained within the car share the same motion-based orientation. To you, the dashboard and your seat appear stationary <relative to you>, whereas these same objects appear to be moving to an observer standing along the street watching you pass by. Similarly, when seated in an airplane traveling at 600 miles per hour at an altitude of 30,000 feet, the airplane, everything contained within the airplane, and all your fellow passengers appear <to you> to be stationary, while the same observer standing alongside the street that watched your car pass by earlier will see the aircraft (and you) as moving. Seated in the moving car or in the flying aircraft, you (and everything around you contained within the same moving space) are experiencing a distinct reference frame, whereas the stationary observer standing on the curb is experiencing his or her own distinct and different reference frame. The important point to embrace is that both observers are viewing the exact same event, but each holds a vastly differing opinion on what is happening.

We take this concept for granted in our everyday lives without really giving it any thought, but it's fundamental to our discussion to understand that two observers can view the same event and have completely different but completely accurate perspectives and experiences as to what is happening. Let's look at another example.

For this next example I would ask that you open your mind to the hypothetical (try and imagine a world without hypothetical situations!). Imagine you're sitting on a platform at a train station and a train passes you traveling at high-speed. This particular train is traveling around a circular track and passes you about once per minute. You're interested in exactly how fast the train is moving around the circle, so you pull out a radar gun, shoot one car as it passes, and determine a speed of exactly 100 miles per hour. You, stationary on the platform, are in a distinct reference frame separate from the moving train. Now as the train passes a second time, you are able to look into one of the windows and you see a baseball pitcher standing at one end of the car practicing his fastball with a catcher squatting at the other end of the car. The pitcher is throwing the ball in the same direction as the train is moving. You're curious how strong the pitcher is, so on the train's next pass you again use your radar gun and clock the speed of the pitcher's fastball at a stellar 200 miles per hour! How can this be? Befuddled, you call a friend who just happens to be on the train, in the same car as the baseball players, and who is also using a radar gun to record the speed of the fastball. She reports that her radar gun records the speed of the pitch as 100 mph, and the pitcher confirms that he throws no harder than what she's recorded. You check your radar gun and re-run the experiment with the same result. So what's going on?

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From your standpoint (reference frame), the train and everything in it is traveling at 100 mph. From the pitcher's standpoint, he's not moving at all, as his reference frame is the moving train and everything it contains (including your friend). Your friend indeed confirms that she can't detect any speed as she sits stationary on the train. We've all experienced this effect at one time or another -- if you haven't, next time you're cruising at 30,000 feet on a jet airplane, close your eyes and try to detect your speed, motion, velocity or direction! Now, have you thought about the conflict in the measured speed of the baseball, and how an individual's distinct reference frame would cause a difference in the recorded measurement? From the pitcher's perspective within the context of his train-based reference frame, his pitch is clocked at an even 100 mph. From the context of your reference frame on the station platform, you measure the aggregate acceleration of the train's speed plus the speed of the thrown ball (200 mph). Now consider if the pitcher and catcher change positions inside the car such that the pitcher is now throwing in the opposite direction from the train's movement. What speed would you now measure the thrown fastball? Of course, you would measure the ball traveling at 0 (zero) mph, whereas the individuals on the train would still measure a speed of 100 mph given their referential relationship to the ball.

One important consideration when thinking about relative motion is with respect to constant velocity versus forced, or accelerated velocity. The examples above and all subsequent dialog assume constant velocity meaning no external acceleration is involved. The difference is in what you "feel" as you experience your distinct reference frame. For example, when taking off in an aircraft, you're experiencing forced velocity as you can feel the thrust from the engines and feedback from the tires rolling on the runway. However, once you've reached a sustained speed and cruising altitude, you no longer feel any of the effects of thrust or any other external feedback. If you close your eyes, your constant velocity situation dictates that you can't directly determine your speed or direction, or in the absence of turbulence, that you're moving at all.

You should now have a basic understanding of what reference frames are and how we experience them in our world view. We'll come back to this a little later when we discuss how changes in gravity affect the flow and constancy of time, and why we should care. Because of the base importance of special relativity to our discussion, I'll provide a few additional summary points to further elucidate.

1. Special relativity defines space and time as complimentary, interwoven and interdependent aspects of our reality, breaking centuries-old beliefs that space was an empty "aether", and time was an absolute constant.
2. Two identical people with identical measuring devices (clocks, rulers, etc.) will measure a single event differently based upon their position relative to the event (observational viewpoint).
3. The speed of light is a constant (186,000 feet per second, 670 million miles per hour, 300 million meters per second). It is theoretically impossible to exceed the speed of light through our space. The key term here is "through our space", as there have been experimental instances of 'faster than light' observations through a medium other than our space-time aether. The aether is a concept originally put forth by Newton, refuted by Einstein, and subsequently brought back into the realm of possibility by modern physicists. These concepts and other physical aspects of light-speed (denoted as "C") are covered in a separate paper titled "C Spot Run".

Gravity Sucks

Now that we have a basic understanding of the importance of the reference frame and how what we experience (and more importantly how we experience it) is relative to our specific referential condition, let's now begin a discussion of the specific ways gravity affects our space-time reality.

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As stated above, it was Albert Einstein who tied space and time together to create a space-time reality, or constant if you will (although the constancy of space and time are relative!). We often (as most Trekkies and science fiction readers are familiar) refer to the relative constancy of space and time as a continuum. The most fundamental point to understand is that space and time are not absolute and independent entities (as Newton believed), but rather absolutely flexible and measurably elastic based upon your relative speed and gravitational properties. In a nutshell, the greater your speed based upon a scale equal to C (from absolute zero to a maximum of the speed of light), the slower you will measure the movement of time. The greater the gravitational properties relative to your position, the slower you will measure time. So both speed and gravity affect time, and because space and time are inter-related, they also affect the properties of the space you inhabit. Your measurement of the passage of time will depend in whole upon your speed and the gravitational properties of the space you inhabit.

Although this sounds simple and is proven experimentally, this is one of the most difficult concepts to grasp for the following reasons:

1. This is entirely counter-intuitive to those of us who spend our entire lives experiencing a minute fraction of the vast range of speed possibilities between absolute zero (stationary) and the speed of light (186,000 ft/sec, or 670,000,000 miles/hr).
2. Time, as we understand it, is really an abstract, man-made property. One of the greatest mysteries in all of science is to understand exactly what time is, and why it always appears to march forward. The popular string theorist Brian Greene (The Elegant Universe, The Fabric of Space) has struggled with this concept for most of his professional working life.
3. No one knows exactly what space is. This, as with time, is one of the greatest scientific mysteries scientists grapple with. From Newton's aether, to Einstein's rebuttal of the aether and introduction of the cosmological constant, to current thinking on dark matter and space being a multi-dimensional fabric (string theory, M-theory, Brane theory, etc.), we just don't know exactly what it is and how to properly define it. The English language is woefully inadequate to describe what we *do* know about space; the language of mathematics is a far better means of describing the space-time properties that we currently understand.

Another point critical to our discussion is to realize that the more matter (size, mass, density, etc.), the greater the associated gravitational constant. To picture this, consider a ping pong ball and a bowling ball sitting on opposite ends of a trampoline. The ultra-light mass of the ping pong ball will have a negligible impact on the surface tension of the trampoline. The bowling ball, with its greater size, mass, density and weight, would noticeably impress the trampoline's surface. Now let's consider that the physical properties of the two objects are reversed. Imagine that the ping pong ball, while retaining its original size, now assumes the original weight of the bowling ball, and that the bowling ball (again maintaining its original size) has the weight of the ping pong ball. What physical properties would need to be transformed to support the weight shifts between objects? The answer is mass and density. Items, regardless of their physical size can be either light or heavy based upon their density and overall mass.

Physicists believe that the big bang originated from a microscopic point called a "Quantum Singularity", measuring something along the lines of the "Planck Length" (a very small point indeed, at 6.6262×10^{-34} , far beyond our ability to probe even with our best technologies), with essentially infinite gravity. It's important not to frame this singularity as a "point in space", because prior to the big bang, *there was no space!* So current thinking is that the big bang started from the smallest non-zero point imaginable, but had infinite mass, density, weight, and therefore gravity.

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So with respect to our topic, what does gravity (and space and time) have to do with reconciling the putative contradiction between the biblical representation of the creation and what science promotes? The answer is *everything*. When discussing the topic with Christians, most will say that “God’s time is different than our time”. While overly simplistic and not founded on specific facts, this is essentially correct. Indeed, as the Creator (defined as the instigator of the big bang), God’s reference frame during the creation events would be different from ours (assuming we were present within the space of the creation). Remember that just prior to the big bang event, there was no space, so God’s reference point would exist outside what we understand as our relativistic space-time reality. Let’s look at one possible way of overlaying the two perspectives such that they compliment each other.

The Road to Reconciliation

If we were present within the space of the creation, we would experience the entire creation from the standpoint of a single, unified reference frame – the entire unfolding of the cosmos, from the moment of the big bang, through the “inflationary period” (a period of rapid expansion that aligns with current observations of the size and temperature of the universe), the continuing expansion of the universe that includes the significant event of quark confinement (a period where the extreme initial temperatures cooled to the point where matter could begin to form), continuing on to the point where matter could begin to further organize into planets, stars, galaxies and galaxies of galaxies – all leading up to the point in time where you can sit and read these words.

The logical question that boils from these histories is “how long did all this take?”, and the answer may not be what you initially expect. Think back to the previous dialog about how gravity affects the flow of time, and the measurement of that flow being based upon your reference frame (position, velocity and speed). Now imagine you were able to view the entire history, from the moment of the big bang to the current moment, from a static position *within* the event space; from your perspective, time and space would unfold according to your specific (relativistic) frame, or the time scale we’re all familiar with (seconds, minutes, hours, days, weeks, months, etc.), and the unfolding would appear as a non-linear event measured from start to finish (more on the non-linear aspects of your measurements in a few minutes). Again, your specific measurements would be subject to the properties of your specific reference frame. Now imagine that you are viewing the same events from a position *outside the space* of the newly-expanding universe – your specific measurements of what was occurring would not be based upon (or subject to) any of the specific properties of the event space, but rather would be wholly based upon properties specific to your <outside> frame of reference. How would the two separate measurements differ?

Again gravity enters the equation as the underpinning property that affects each observational viewpoint. From your perspective *within* the event space, you are subject to whatever gravitational properties exist at each moment as the new universe unfolds, and any change in the gravitational constant of the new universe is also your reality (also affects you and your observational viewpoint). The Creator, on the other hand, positioned *outside* the event space would not be subject to any of the changes occurring during the expansion and growth of the universe, and thus would observe the creation, expansion and formation from a completely different reality (in this case as a wholly linear event). As the new universe expands and is formed, the outside observer (from the observational standpoint) wouldn’t be subject to changes in gravity, time, temperature, or matter.

Figure 1 below shows this pictorially, followed by a more detailed explanation of how the differing observational perspectives overlap.

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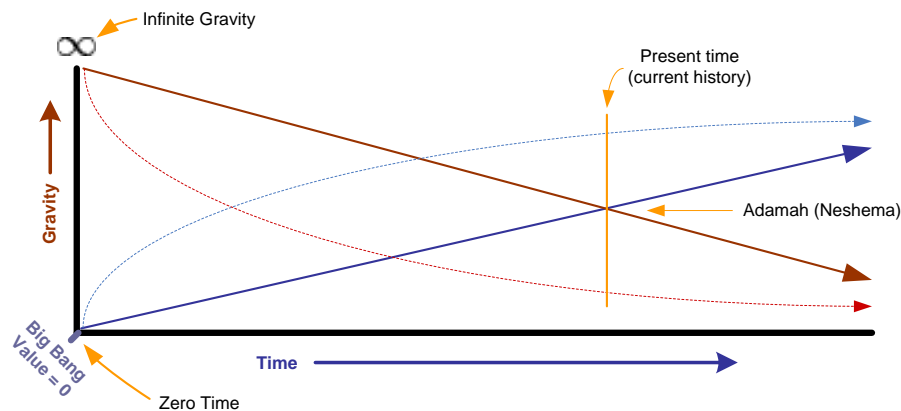


Figure 1: Mapping time and gravity against differing reference frames

In this figure, the vertical **Y** axis tracks gravity from zero to infinity, and the horizontal **X** axis tracks time from zero to recent history. As time didn't exist prior to the big bang, the **X** axis zero point measures from that event through today. We've already learned from the previous document sections that gravity affects time, or more specifically, how fast it flows (or even more specifically, its measured speed based upon your relative observational position). The stronger the gravitational constant, the slower time will flow (or be measured). As gravity decreases, time speeds up (or said differently, we will measure an acceleration of time's flow as the strength of gravity weakens). This is Einstein's Relativity in a nutshell.

Figure 1 shows that at the moment of the big bang, there was infinite gravity at the point of the (quantum) singularity. As stated above, most modern scientists believe that our space-time reality originated from a single point about the size of the Planck Length ($6.626... \times 10^{-34}$ Joule/seconds) and with infinite gravity (infinite mass). The figure also indicates that at this point time would equal absolute zero. This is the starting point for our discussion of the unfolding of the cosmos and the reconciliation of the two differing perspectives on the age of our existence.

Mapping Time against Perspective

As an avid adventurer/explorer, I frequently make use of topographic (geological survey) maps to understand the lay of the land I'm visiting. Maps come in different "scales" or units of measure based upon the observational perspective (in this case height) from which the map is constructed. For the most part I use either 15 minute or 7.5 minute maps (degrees of resolution based upon the duration of measurement). The 15 minute map shows the terrain from a greater height and is less specific terrain detail. The 7.5 minute map is constructed from a lower height and depicts much greater resolution of specific terrain detail. *The two maps serve different purposes based upon the user's need.* A trained eye would recognize that the two maps actually showed the same landscape, but from different perspectives and levels of detail.

Using this as an analogy for our discussion, this is the very crux of the idea I'm promoting – that our scientific perspective and God's biblical perspective describe the same events but from different perspectives and with different purpose. Let's see how.

So far we've discussed the problem, provided a chart that appears to show a meaningful overlap of events, provided an introduction to gravity and relativity, and presented a graphic that depicts the two separate points of view based upon differing observational perspectives. Figure 2 below provides a legend to Figure 1 such that we can now map time against perspective for each observer.

The Gravity of Creation

An Essay on the Convergence of Scientific Knowledge and Biblical Wisdom


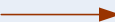


	Internal Observer	External Observer
Gravity		
Time		

Figure 2: Legend for Figures 1 and 3

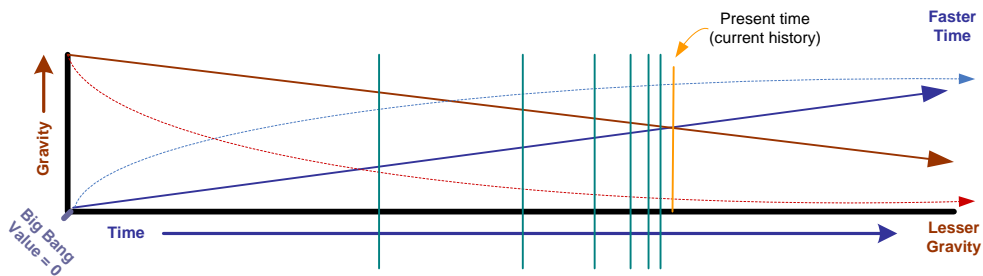


Figure 3: Time Dilation and Relativistic Affects

Unfinished work:

Sorry this isn't finished yet – I'm sure you're anxiously awaiting the punch line for this tome... I promise to finish this paper shortly, and wrap-up the discussion in a satisfying conclusion ;-)))