

Over the past 100 years, science and archaeology have drastically changed our view of the universe and prehistoric times. It is likely we know more now about the beginning of the universe and ancient civilizations than any other time in history.

But could this modern knowledge change how we see the oldest and most unlikely Bible lore?

*Did creation only take 144 hours?*

*Why is there no mention of dinosaurs?*

*Did Adam and Eve invent clothing?*

*How can someone live for 900 years?*

Using contemporary analyses such as this, we seek to inspire a more contextualized reading of the Bible as a whole.



A Multidisciplinary Contextualized Analysis of Select Passages From Genesis - Woolridge

# A Multidisciplinary Contextualized Analysis of Select Passages From Genesis

George J. Woolridge

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George. J. Woolridge

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# Introduction

Nearly all religious texts are largely considered to be legends or purely symbolic by the secular world. Rarely are they considered to be any more than fiction and are often quickly dismissed by the non-religious as such.

However, throughout the Bible are verifiable accounts of people, places, and events making it as much a historical reference as it is a religious text. To be clear, it is not without its parables, supernatural tales, and legends that even the most devout believer might consider symbolic or borrowed lore. And this hybrid of history and the fantastic has led to much debate between those who wish to observe scripture as a plain language collection of facts and others who see it as largely allegory or fiction. Devout believers and religious scholars throughout history can be found at all points in this spectrum.

In particular, the book of Genesis is largely considered to be a fairytale. The first dozen or so chapters describe the world being created by the decree of a deity, people with lifespans of nearly 1,000 years, and a flood enveloping the world.

The popular Interpretation of these chapters may have caused more division between people across all degrees of belief throughout history than any other passages in the Bible. These seemingly indefensible supernatural legends continue to draw ridicule from the secular and scientific communities marginalizing their relevance.

I have long found the common interpretations of Genesis to be inadequate. Not that I expect the stories to be line-by-line facts, but it is one of the few parts of the Bible considered by most to be devoid of applicable truth.

This crisis of scripture was fresh on my mind while researching some scientific developments within the past century. As I

delved deeper into new discoveries in paleontology, dramatic shifts in how we viewed the universe, and the emergence of quantum mechanics, there appeared an increasing number of parallels between these theories and this religious fable.

I challenged myself to read these first chapters, suppressing my knowledge of popular interpretations to try and gain a fresh perspective. This led to my scrutiny of key terms that did not seem to fit the common narrative. It soon became apparent that there may be more truth woven into this largely disregarded tale.

Perhaps our outmoded view of this ancient story needed revision.

Although it is modern science that I believe has breathed new relevance into Genesis, to simply re-read a modern paraphrase of the Bible with our 21st century sensibilities will provide little additional insight. To fully realize this tale from antiquity, we must take every consideration to place Genesis in the most accurate context.

I invite you to grab a Bible and read it with the following considerations.



## What would you know if you didn't know what you now know?

Due largely to advances in transportation and media, human kind has literally “seen it all”. The average person has been exposed to so many ideas and visual experiences, including those real and imagined, that it is unlikely for the average human to witness something that is truly “indescribable”. Now, with nearly worldwide access to the internet, anyone can become familiar with any topic or experience the sights and sounds of almost anything that has ever existed. Every one of us right now has an exponentially greater access to knowledge than anyone at any other time in history.

But if we look back hardly more than 100 years ago, most people rarely traveled beyond a 10 mile radius in their lifetime. Outside of the needs of daily life and their particular trade, individuals would be exposed to little intellectual variety beyond what was required of them or could be found locally in a library or museum. This meant the majority of people had a limited inventory of mental images, experiences, vocabulary, and ideas. Their knowledge base would also be unique compared to other geographical regions or employment specialties. With a smaller and more individual inventory of language and experience to pull from, unusual observations are more difficult to accurately describe for a general audience.

The first challenge of my contextual analysis is taking into account a realistic consideration of what the knowledge base of a person who lived 3,000 or more years ago might be. This is not to imply a lack of intelligence or the ability to understand an extraordinary concept, but there would be challenges in expressing such an idea to a diverse audience. Something described by ancient people will need to be relatable to the visual experiences and scope of vocabulary common at the time.

## The state of the ancient world

After doing our best to “unlearn” a few thousand years, we still need to figure out the environmental context of the world we are trying to understand. Historical geography and archaeology is giving us insight into the ancient world in ever growing detail. We may now know more about life and global climate during the ice age than anyone in recorded history.

Also, paleontological evidence now shows us that the earth has changed drastically over millennia. For example, what is now the Sahara desert was a tropical grassland less than 6,000 years ago. That means the whole of Egypt was green during the lifetime of some of the mummies we have uncovered. If we had a photograph of their pyramids when they were built, one might mistake it for today’s tropically located Mayan pyramids.

In Genesis, the author is describing the ancient past beyond the time of recorded history. If we are to believe they are relaying accounts from or inspired knowledge of that time, we would need to make an effort to understand how the region might be different than today. With our ever growing knowledge of the prehistory world, we have an unprecedented view into the life and environment of people who lived as far back as the last ice age.

## A very brief view of cosmology in history

Although science is considered to be a fact-based discipline, progress has always been either driven or impeded by belief. The examples of ancient people believing the earth to be flat or the center of the universe are often mentioned. But even the scientific titans of the early 20th century thought the universe to be very different from what we accept as scientific fact today.

Throughout history, the majority of people have held the belief that the universe has always existed. Nearly all scientists, philosophers, and theologians around the world supported that view. As late as 1917, even Albert Einstein published *Cosmological Considerations in the General Theory of Relativity* which claimed that the universe was temporally infinite. This confirms that even the most influential scientists within the last hundred years believed in a universe with no beginning and no end.

As for religious origin stories, the focus is typically on the origins of Earth or humanity. An exceptional few detail the beginning of fundamental aspects of reality like light or the beginning of time. The book of Genesis is rare among origin legends on that point alone which has resulted in criticism of Biblical scholars throughout history.

Only within the last 70 years or so has observational evidence like the Cosmic Microwave Background (or CMB) strongly suggested that the universe as we observe it is temporally *finite*. Due to the growing body of readily observable evidence, only now is a cosmic origin broadly accepted as fact.

Although modern science marginalizes many religious origin stories as wholly incompatible with cosmological reality, it seems the better we understand the beginning of the universe the more closely it mirrors the Bible. In fact, it was the Belgian Catholic priest, Georges Lemaître, that was the first to propose

the Big Bang model of the universe which dominates current scientific theory.

## The measure of a “Yom” (יום)

Few people read the Bible in its original languages making our reading subject to the interpretation of a translator. As word-for-word translation between languages does not typically provide a readable result, Interpretive paraphrasing is common in Bible translation. Certainly this is done by committee with the utmost care to retain the philosophical content, but there is inevitably interpretive license and preconceived ideas of how the verses should be read.

To compound this concern is the occasional lack of equivalent vocabulary between the source and target languages. For example, there are seven Greek words for “love” that each require several words in English to describe or place into an accurate context. If the translation doesn’t account for that explicit level of detail, there could be lost meaning or context.

Hebrew seems to be the opposite case where there is a more limited vocabulary with a multitude of context-dependent definitions. Words often have implied meanings, for instance whether an amount is considered a fixed or flexible quantity, which go back to antiquity. This requires the reader to understand the context of and maybe even the historic use of the statement to determine the explicit meaning of the word. For example, “Yom” (יום) is typically considered the Hebrew term for “day”, but it can be used loosely for any finite period of time. A “Yom” could be billions of years. And even if describing multiple “Yom” in sequence, each could be a different period of time. In fact, nothing precludes a “Yom” from containing several “Yom”.

Henceforth, I will be using the term “Era” (as opposed to the less specific “Day”) in all cases where “Yom” (יום) is mentioned. “Era” explicitly expresses the meaning of “Yom” in this context. It has also been selected to avoid

confusion as other popular synonyms (age, epoch) are commonly used for other terms used.

This being the case, choosing the intended meaning of a Hebrew word can already be problematic. And with such a linguistic tradition one needs to consider if words with compound definitions may be used to embed deeper context<sup>1</sup>. Categorical use of language might allow a memorable and simplified phrase to contain a more complicated image.

This practice of compounding meaning within the existing vocabulary continues today. The Academy of the Hebrew Language in Jerusalem assigns existing Hebrew words to thousands of modern terms that emerge from other languages every year. Although this is done in an attempt to prevent cultural dilution of the language, as time goes on the popular use of many words will drift further from its use historically. Without an intimate understanding of the timeline of such changes, this may serve to complicate translation from ancient Hebrew going forward.

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<sup>1</sup> <https://www.aish.com/ci/sam/48951136.html>

## Literary Structure

Among historical, scientific, and linguistic considerations, one must also consider the literary structure. Many passages in the Bible are often quoted as one liners, and analysis is often done on a verse-by-verse basis. However, there is a clear literary structure to the beginning of Genesis.

Genesis 1 through 2:4 is structured as follows:

- 1:1 Introduction
  - 1:2 Exposition
- 1:3 Declaration
  - 1:4 Confirmation
- 1:6 Declaration
  - 1:7 Confirmation
- Declaration/Confirmation pattern continues
- 2:4 Conclusion

Considering the structure of the chapter in its entirety, the first action towards creating the earth clearly takes place in verse 3, not verse 1 as is often the interpretation.

Additionally, there is a progressive change of scope as we read through each “Yom” (יום). If one considers the magnitude of each of God’s declarations, this pattern emerges.

1. The entire universe filled with the first light.
2. The condensation of nebulas that form into galaxies like our own.
3. Planetary bodies of our solar system and main sequence ignition of our sun
4. Major geological features of Earth and Vegetation
5. Sea and air creatures that would be around most of the Earth

6. Landlocked animals and then specifically  
mankind

As we move into chapter 2, the narrative narrows to:

7. An individual human

As a visual interpretation of this progression, I propose two different points of view.

The first is the “Space-Centric” perspective or “far-to-near” interpretation which follows a progressively narrowing omniscient view. Each “Yom” we would view the process of creation on a progressively smaller scale. This is the kind of visual that I believe would be most appealing to the modern imagination for those studying Genesis today.

However, the “Space Centric” perspective requires one to have an understanding of space as we understand it now. Only a century ago this visual would have been a challenge, let alone a few millennia.

Alternatively, the “Earth Centric” perspective is the experience from a single observer’s point. This location would be at the Earth’s surface once it forms. The progress of creation would be described from the visual perspective of a person “at the scene”.

I believe this “Earth Centric” interpretation may better accommodate the knowledge and experience base of ancient people which is the primary focus of this exercise. Concepts of deep space, a round earth, and celestial bodies the way we now understand them would already be problematic. Persons of this time would have never been any substantial distance above the ground themselves, and several verses in this chapter use a ground-level reference to describe the events.



## Don't shoot the interpreter

In this analysis I have attempted to disregard all of my preconceptions and biases as best I could. This has resulted in an interpretation of Genesis that is in many ways drastically different from popular visualizations.

I also take some interpretive license by reading Genesis as though it is truthful even if not entirely accurate. I do not presume that a story this dated would be maintained with flawless accuracy, and variations between ancient copies of Genesis show this to be the case.

More specifically, I do believe there is significance to the order of the events in the first chapter. But it is my opinion that, in 3,000 years of oral tradition and manual transcription, some modest rearrangement is acceptable. In short, I simply swap the 3rd and 4th "Yom" to better fit my interpretation of visual scale and the latest theoretical timeline of Earth's formation.

Finally, this is meant to be a strictly analytical view on the scientific and . I am not seeking to address theology or morality of Genesis, nor confirming any stories to be fact or fiction. This is largely a demonstration of the parallels between modern scientific and historical theory and the contents of Genesis when analyzed in proper context.

The following is my interpretation of select passages in Genesis starting with chapter 1. For brevity, only key verses being discussed are included. To view the chapters in their entirety I recommend having a complete Bible available. I am using the [World English Bible \(WEB\)](https://ebible.org/web/) translation which is freely available on the internet.<sup>2</sup>

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<sup>2</sup> <https://ebible.org/web/GEN01.htm>

To minimize confusion between my interpretation and the source verses, I will make some substitutions [enclosed with brackets] with valid synonyms to the commonly used terms. Although this may diverge from familiar translations of the Bible, the content of the verses themselves is unchanged. I encourage the reader to follow in parallel with a complete text in their preferred translation for reference.

# Genesis Interpretation

1:1 In the beginning God created the heavens and the earth.

As mentioned in the section on [Literary Structure](#), the first verse of Genesis is meant to be an introduction, not an event.

To support this “introductory verse” interpretation, every action God takes throughout the first chapter of Genesis is declared before it occurs. To follow that literary pattern, verses 1 and 2 are the introduction and exposition for His first declaration in verse 3.

Scientifically speaking, stating that there was a “beginning” to the universe is unusual for theology, philosophy, and science prior to the 20th century. As described in [A Very Brief View of Cosmology In History](#), it is only within the past 70 years or so is there now convincing scientific evidence of a finite universe.

What defines cosmology in the 20th century is the broad acceptance of a cosmic origin and speculation regarding the universe’s inevitable fate. These are the same historically divergent concepts introduced millennia ago in Genesis and discussed throughout the Bible.



1:2 Now the earth was formless and empty.

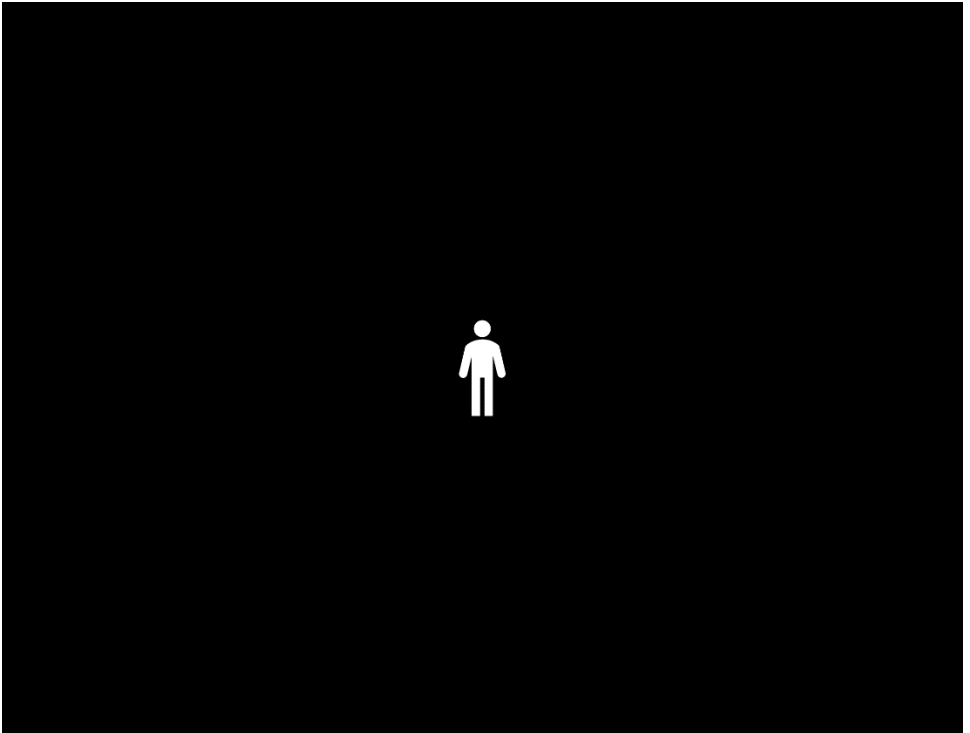
Darkness was on the surface of the deep. God's Spirit was hovering over the surface of the waters

Cosmological Event: Prior to the Photon Epoch

Age of universe: 0

Continuing onto a brief exposition, the earth is described as having no shape or content. Although we might consider the word choice to be mellifluous, we have to consider if the concept of no earth would even be understandable to ancient people. Remember that a round earth in outer space was not popularly understood at the time. This brief description was meant to make sense to people 3000 years ago who only understood a flat world at ground level.

Instead of saying the earth did not yet exist, the author may have been trying to establish the concept in reverse. A paraphrase might read, "Imagine if the entire earth were replaced by a giant empty hole." I believe the author is trying to convey the idea of empty space by having the audience leverage an accessible concept.



Having “Darkness” on “the surface of the deep” further emphasizes this visualization relating it to those who work on the water. A moonless and starless night while out at sea could provide the empty pitch-black visual the author is conveying. This experience would have been common to ancient coastal communities who could relate to the sensation of nothingness.

Although “hovering over the surface of the waters” sounds to us as though there is a tangible liquid present, this is a continuation of the dark water visual which is meant to be “empty”. Paraphrased, he is stating that, “The invisible ghost of God was in the empty formless dark space.” Realistically considering the depth of vocabulary and life experience 3000

years ago, these two sentences are simply meant to induce that specific visual.

However, my interpretation does not preclude the possibility of deeper implied meaning. Modern cosmology and quantum mechanics also describe the invisible early universe in surprisingly “liquid” terms. All matter and particles smaller than a few hundred molecules travel in a way that current scientists describe as probabilistic “waves“. Quite literally, when a particle is in motion, it is thought to exist in an undefined “wavelike” state like ripples on a pond.

Further support of this idea is the Higgs Boson which is thought to have filled the early universe. We cannot directly observe these particles which are believed to have all decayed before the Photon Epoch, but CERN believes it has produced them experimentally. These pre-matter quantum “God particles” would have been the ultimate invisible “water” filling the “empty” universe. Could "Waters" as a description of the contents of a formless space full of quantum potential have foreshadowed our understanding of particle physics today?





1:3 God said, "Let there be light," and there was light.

Cosmological Event: Photon epoch  
Age of universe:  $\approx 10$  seconds

Albert Einstein once asked Abraham Pais, "Do you really believe the moon is not there when you are not looking at it?" While attempting to disprove the observation dependent results of quantum mechanics, Einstein's own arguments eventually lead scientists to prove it to be true. Photons and other elementary particles in motion exist as probabilistic waves that are not in any one place until they are "observed" or interacted with in some way.

This implies that before any particle could physically exist in the universe, there needed to be something or someone to interact with or "observe" it. This presents the strange possibility that an unobserved universe might never exist to begin with! Since the universe most certainly does now exist, this has left many quantum physicists with the peculiar question of how.

Interestingly, the first notable action of God is to demand observation of a fundamental elementary particle. Our current observations of the Cosmic Microwave Background (CMB) strongly suggest that visible "light" may in fact be one of the earliest fundamental particles present throughout the universe.

As mentioned previously, the Higgs Boson (often labeled the "God particle") is a theorized quantum non-standard model particle that would have been abundant in the universe before the Photon Epoch. At that point, there was a simultaneous decay of all the Higgs Bosons to some of the standard model particles we observe today, including photons. In 2014, researchers at CERN believed they had produced this primordial particle and observed its predicted products.



Per current popular scientific theory, at roughly 10 seconds after the Big Bang the universe is dominated by photons. In a very literal sense, the contents of the universe is entirely “light” without anything to cast a shadow.

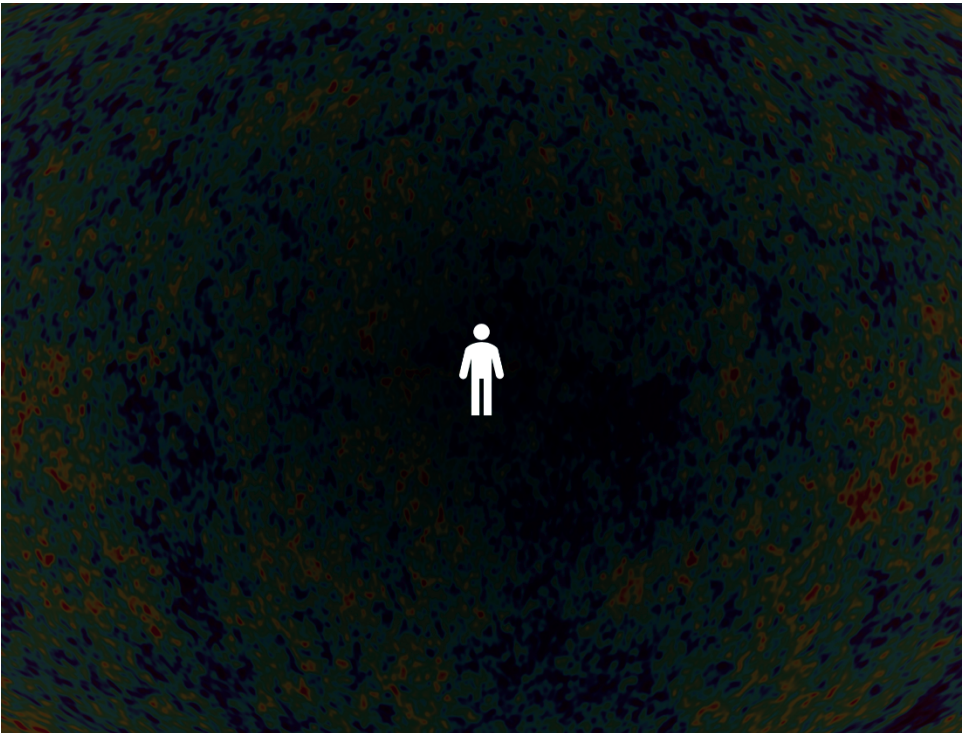
1:4 God saw the light, and saw that it was good.

God divided the light from the darkness.

Cosmological Event: Recombination

Age of universe:  $\approx 379,000$  years

Scientists theorize that around 379,000 years after the Photon epoch, enough matter had formed in the universe to absorb the photons. With something to separate "light and darkness", the remaining "decoupled photons" are absorbed or red shifted and the entire universe goes visibly "dark" again for roughly the next 250-650 million years.



The Cosmic Microwave Background (CMB) is believed to be the remaining redshifted photons from the Photon Epoch. This is evidence of the homogenous distribution of primordial

particles (like the Higgs Boson), and the relativity-defying simultaneity of this epoch across the universe.

1:5 God called the light “day”, and the darkness he called “night”.

There was evening and there was morning, the first [era].

Cosmological Event: Photon Decoupling (Dark Ages)  
Age of universe:  $\approx 150,000,000$  years

This verse is likely the source for the Jewish observation of sunset marking the beginning of the next calendar day. As implied by this verse, each “Yom” begins with the onset of darkness and ends at the conclusion of the light.

But in my opinion, this calendar practice seems oddly counterintuitive.

- Outdoor temperature and animal activity is often at its lowest point just before sunrise making that the most logical scientific division of days.
- It is commonplace for humans to continue their activities into the evening hours as opposed to retiring immediately with the sun. Perhaps this is a more modern cultural habit, but the common observation of “midnight” seems like a more natural division of days.
- Read plainly, the “day” began when God declared, “Let there be light”, and ended when he “divided” them bringing back darkness.

Might the terms have been reversed in transcription? Should it read morning and then evening? Or is there a double meaning to this verse?

Interestingly, the Hebrew root for "Evening" or "עֶרֶב" is also a root for "to mix, confuse" which implies a kind of homogenized disorder. "Morning" or "בוקר" shares root meaning with the terms "controlled, audited, reviewed". Also consider that the word for day ("yom" or יום) can be used to refer to any arbitrary finite period of time.

This may be a case where additional meaning is implied by the shared roots of the common words used. It could even be argued that the typical interpretations of the Hebrew may not be the true definitions intended by the author. Or, to facilitate oral history, perhaps simple to remember terms and traditions are used to ensure that these deeper interpretations survive from antiquity.

By using collateral meanings for roots of the specific terms mentioned, the second sentence of verse 5 could read:

There was *disorder* (עָרָב) and there was *order* (בּוֹקֵר),  
the first Era (יָוֵם).

At the end of each "era", God gives a name to His creation implying that it did not exist until this point in time. It is this specific and orderly emergence of such fundamental components of the universe which largely separates this story from others from antiquity.

This story also parallels scientific theory to an ever increasing degree. What is commonly believed by the scientific community is that the universe started in optical darkness filled with some exotic particle or energy (like the Higgs Boson). When those particles decayed, they became photons (light) and the various other invisible fundamental particles which go on to form the earliest matter of the universe. These particles form atoms that eventually absorb most of the light in the universe.

On other words, modern science tells us that:

- In the beginning of the universe, the empty and dark universe was all at once filled with light (photons).

- This light was eventually “separated” from space by early matter to the point of optical darkness.
- This first transition of light and dark which was simultaneous across the entire universe is permanently evident by the discovery of the Cosmic Microwave Background (CMB).

Current theory estimates that the universe remained visibly dark for the next 400 million years before the first stars formed.





1:6 God said, "Let there be an expanse in the middle of the waters,

and let it divide the waters from the waters."

<sup>7</sup>*God made the expanse, and divided the waters which were under the expanse from the waters which were above the expanse; and it was so.* <sup>8</sup>*God called the expanse "sky." There was evening and there was morning, a second [era].*

Cosmological Event: Earth Forms

Age of universe: ≈9,259,000,000 years

Following our earth-centric observational point, I skip ahead to the formation of our own solar system. Although stars and galaxies have formed in the universe well before this time, As the Earth formed within a protoplanetary nebula, "waters" seems like an appropriate description for what would seem like a "gathering" of gaseous material. The "waters" under the expanse form the ground below the observer, and the "waters" above include what will become the moon, sun, and other features.

Our solar system's accretion disk would shroud the early Earth in an opaque cloud of gas until the Sun main sequence ignition. Even if the Earth was illuminated to some degree by starlight, it would be diffused making distinct objects or stars difficult to see.



Alternatively, were our frame of reference “space-centric”, during the cosmic “dark ages” matter is collecting into nebulas that will soon form stars. In a literal sense, an expanse is forming between the precipitated matter or “waters”. This era would span the period from roughly 150 million to 550 million years from the beginning of the universe.

I do not expect this frame of reference would be conceptually accessible to most people in excess of 3,000 years ago. But in the 21st century, that interpretation may seem more relevant, and I mention it here for that reason.

1:14 God said, "Let there be lights in the expanse of sky to divide the day from the night;

and let them be for signs, and for seasons, and for days and years;

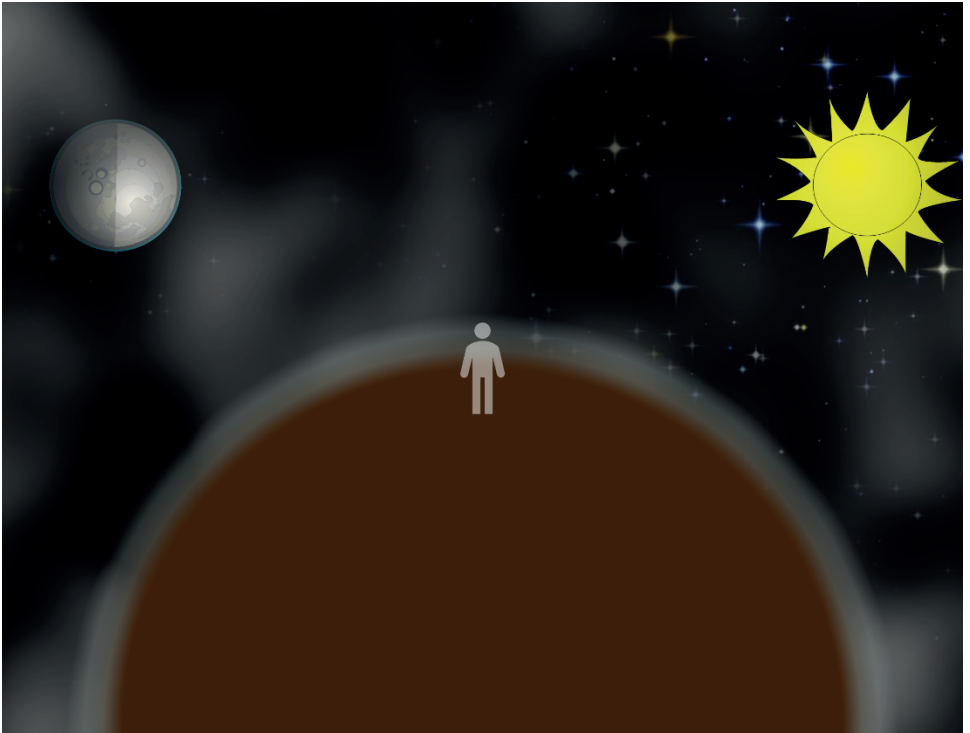
*<sup>15</sup> and let them be for lights in the expanse of sky to give light on the earth;" and it was so. <sup>16</sup> God made the two great lights: the greater light to rule the day, and the lesser light to rule the night. He also made the stars.*

Cosmological Event: Sun main sequence

Age of universe: ≈9,299,000,000 years

You may have noticed that we have skipped ahead by an "era". As a matter of theology, I do not expect the sequence of some of these events to be considered critically significant. Also, no one before maybe a hundred years ago would have speculated that these verses might parallel scientific observation in any way. As the accuracy of the order of eras in Genesis could be debated, I ask that the reader consider a transposition of verses in this one case.

At the end of the previous "era", the earth is shrouded in a thick cloud of gasses within the protoplanetary disk. Additionally, the early atmosphere spewed violently from the volcanically active surface and would be thick enough to block out the sky. Although the universe would have been teeming with stars and galaxies, an observer at the surface of the early earth would not see stars, other planets, or even the moon. At least until the sun achieved main sequence ignition.



When enough matter accumulates in the center of a stellar accretion disk, the immense pressure at the center spontaneously begins nuclear fusion. A star in main sequence, like our sun, is serendipitously balanced between gravitational pressure and the outward force of fusion. This equilibrium provides consistency essential for life on earth.

In a relatively brief time after the sun's main sequence ignition, lighter gasses and dust are blown away from the inner solar system by solar wind. It not only illuminates the moon and planets, but also unveils the stars and galaxies beyond our solar system for the first time. This delayed reveal may explain why stars seem to be an afterthought in verse 16.

1:9 God said, "Let the waters under the sky be gathered together to one place, and let the dry land appear;" and it was so.

*10 God called the dry land "earth," and the gathering together of the waters he called "seas." God saw that it was good.*

Planetary Event: Formation of oceans

Age of universe: ≈9,999,000,000 years

Considering that most terminology we now use to describe cosmology, deep space astronomy, and quantum mechanics are less than a century old, it is reasonable to assume that ancient people might lack more specific vocabulary to describe such concepts. If this scripture is truly an inspired account of the universe's origins, it was described thousands of years ago. This predates telescopes and knowledge of nebulae at a time that the earth was still believed to be flat.

To this point in Genesis, "waters" has been used to describe various properties of the early universe. The concept of a body of water in darkness is experientially analogous to the total darkness before the beginning of the universe. The thick clouds of dust and gas that made up our solar system's accretion disc would have the appearance of diving in a murky whirlpool. Even as the protoplanetary disk dissipates from the solar winds, earth would for a time still have an opaque lower atmosphere which would give it a jovian appearance until it eventually cleared or precipitated revealing the ground below. An observer of these events time compressed might perceive this to be the settling of liquid to oceans and lakes.

Alternatively, some geological theories propose that our planet was largely covered in liquid shortly after the mantle formed.

The earth may have been formed mostly flat with major geological features emerging over time. Continents and islands would rise from the water and migrate around the planet's surface through the movement of tectonic plates and volcanic activity.



In either case, the “waters” would eventually reveal “dry land”. Note that the naming of "dry land" and "seas" indicates the first appearance of these earth specific features. Also, the term "water" has so far been for anything visually fluid, but from this point on is limited to terrestrial H<sub>2</sub>O.

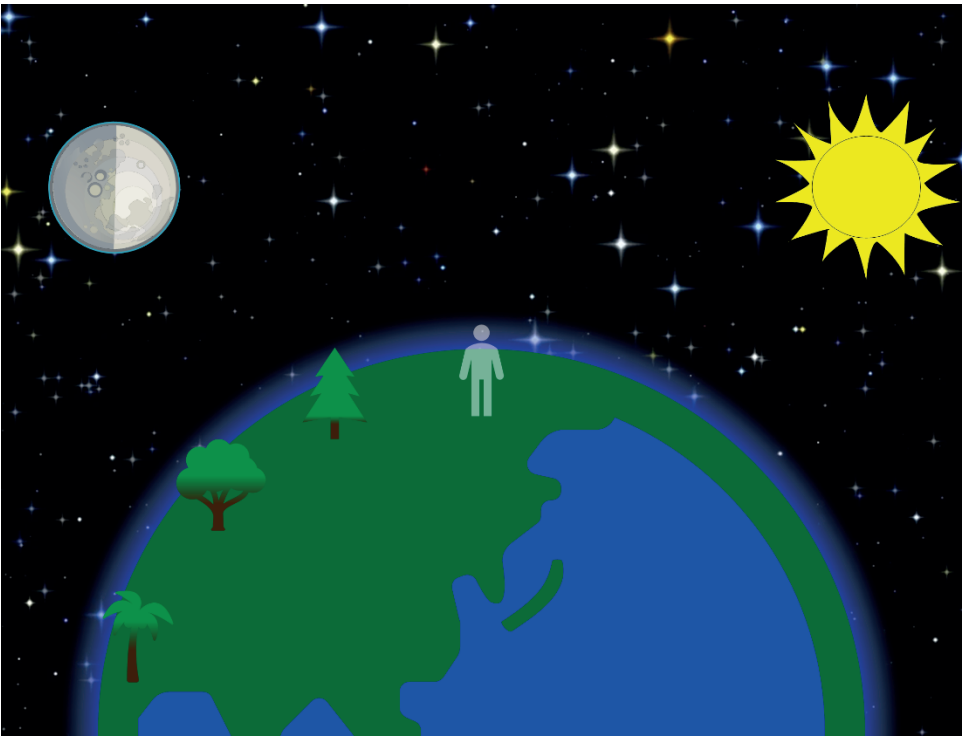
1:11 God said, "Let the earth put forth grass,  
herbs yielding seed, and fruit trees bearing fruit  
after their kind,

with its seed in it, on the earth;" and it was so.

Planetary Event: Earliest trees

Age of universe:  $\approx 13,414,000,000$  years

Although there is ongoing research on what plants or animals evolved first, there is a good estimate regarding some of the larger examples we've uncovered. To try and date these eras, I am centering on major examples described that would be easily observed at the earth's surface. The emergence of trees would be one such notable and plainly obvious event.







1:20 God said, “Let the waters abound with living creatures,

and let birds fly above the earth in the open expanse of the sky.”

Planetary Event: Earliest flight birds

Age of universe: ≈13,629,000,000 years

Most evolutionary theories and evidence support the idea that life began in water which covered the majority of the earth’s surface. Although sea animals may have predated early plants, much of this activity would be largely submerged. Larger enough fish to be readily observable from the surface would have appeared later.

As far as birds being the next creature mentioned, we should address the *Patagotitan mayorum* in the room: Why are giant lizard creatures like the dinosaurs not mentioned?

Most current research on dinosaurs shows that many are more closely related to birds. There is now strong evidence to show that the popular *Velociraptor mongoliensis* was warm blooded and fully feathered. Even *Tyrannosaurus rex* is now considered the direct ancestor of modern day chickens<sup>3</sup>. In a very literal way, the surface of Earth was dominated by the ancestors of birds for millions of years.

Even when considering the morphology of pre-bird animals, many dinosaurs likely had behaviors and fanciful coloring that was passed down to modern birds.

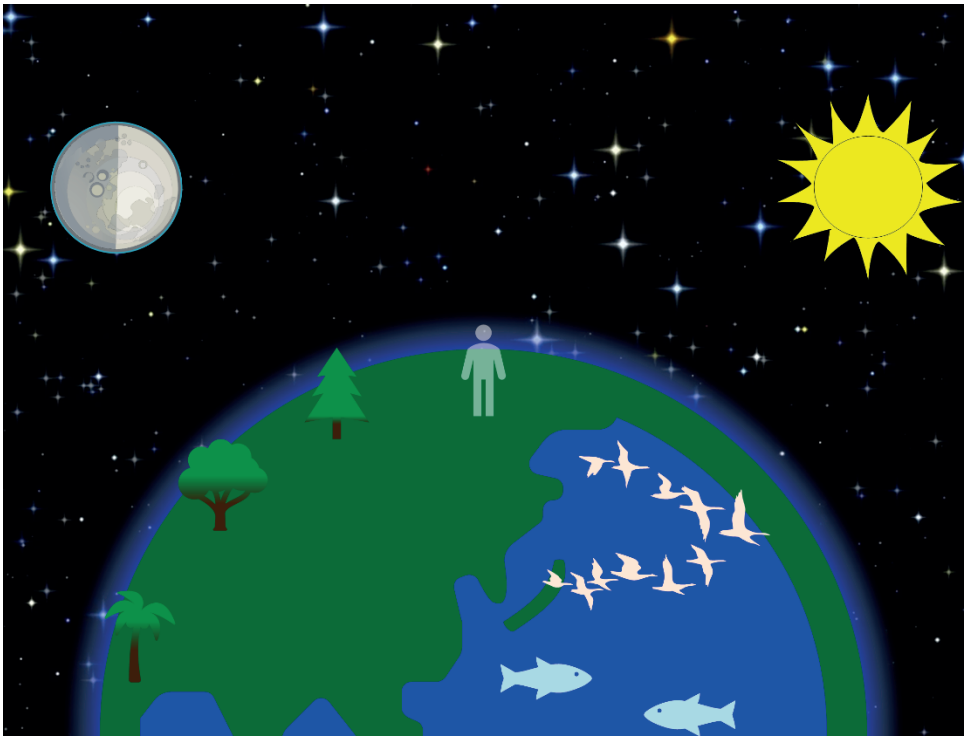
There were also many flying creatures throughout the evolutionary ages. Pterosaurs are believed to have predated

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<sup>3</sup> <https://news.harvard.edu/gazette/story/2008/04/molecular-analysis-confirms-t-rexs-evolutionary-link-to-birds/>

early birds by 80 million years. Even some large flying insects, like meganeuropsis permiana which lived nearly 300 million years ago, had a wingspan in excess of 2 feet making them larger than many birds today. From afar, such a swarm would easily resemble a flock of birds.

Depending on the observer's mental catalog of such creatures one's first impression of any of these examples might appear to be avian. Or the originator wanted to provide the most accessible visual for their audience.

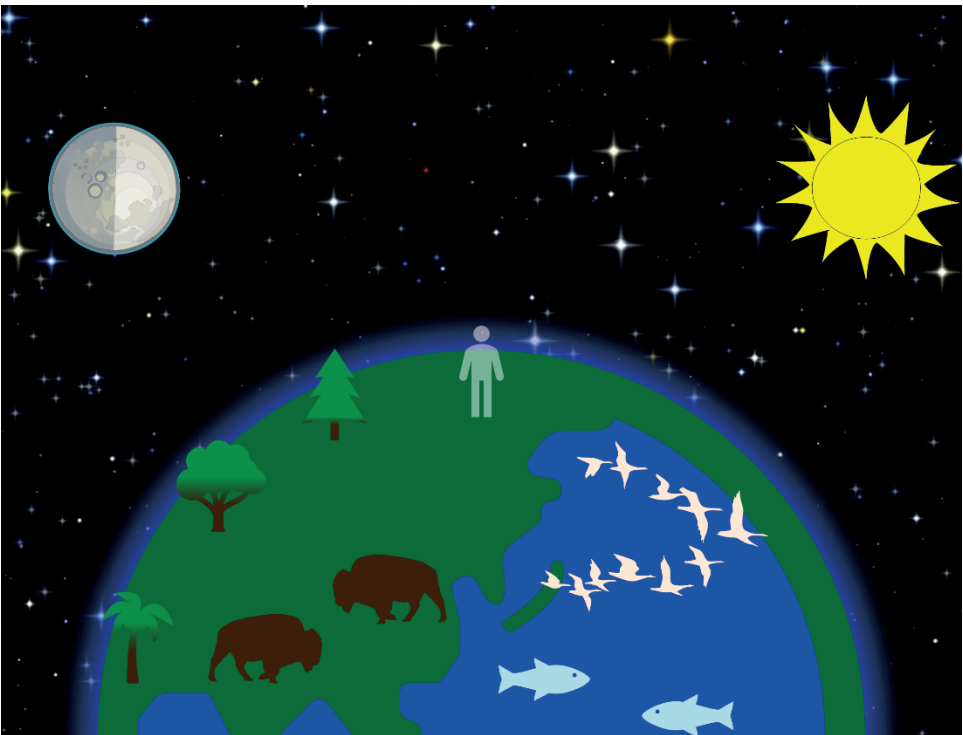


For the purpose of establishing a timeline in this document, I arbitrarily chose to date this era on the emergence of the earliest flight birds.

1:24 God said, "Let the earth bring forth living creatures after their kind, livestock, creeping things, and animals of the earth after their kind;" and it was so.

Planetary Event: Grazing Mammals  
Age of universe:  $\approx 13,774,000,000$  years

Mammals are believed to be the last of the animal classes to evolve. As cataclysmic events and gradual changes to earth's climate make it prohibitive for many of the larger prehistoric animals to survive, the highly adaptive mammals and other "creeping things" thrive.



There are certainly many different creatures throughout the eons that could qualify as a “creeping thing”. I do not debate that there is a substantial overlap between all of the animal categories implied in these verses. But it is my opinion that the most notable examples of each would have become obvious to a casual time-traveling observer in the order described.

To date this “era”, I chose to focus on the mention of “livestock”. The earliest large mammalian herbivores roamed the Earth roughly 25 million years ago.

1:26 God said, "Let us make man in our image, after our likeness:

and let them have dominion over the fish of the sea, and over the birds of the sky, and over the livestock, and over all the earth, and over every creeping thing that creeps on the earth."

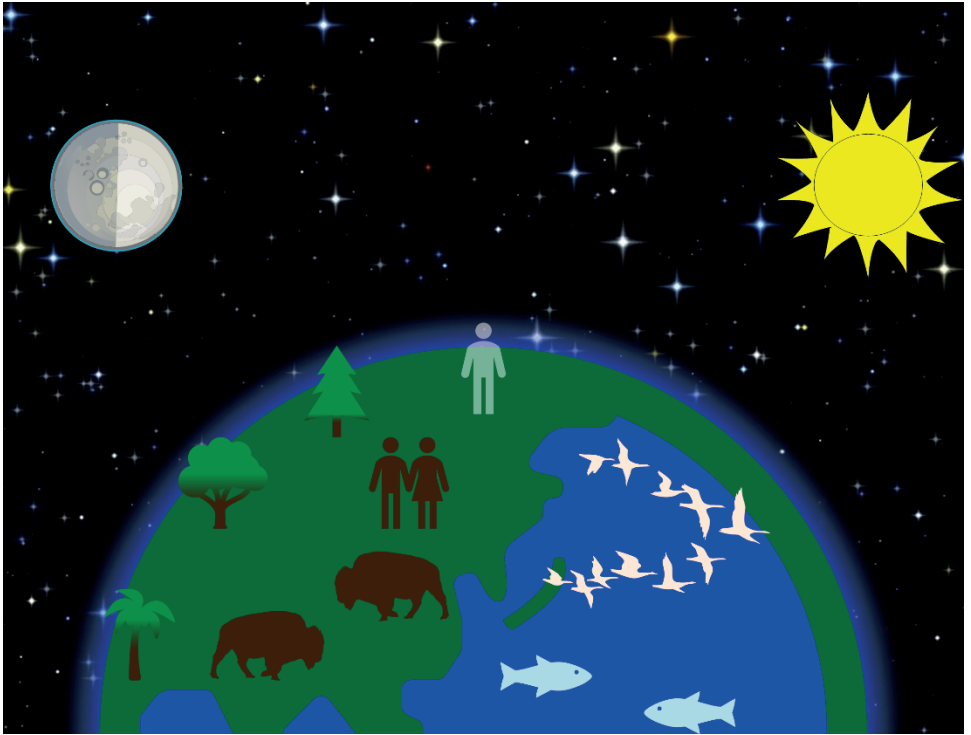
*27 God created man in his own image. In God's image he created him; male and female he created them.*

*29 God said, "Behold, I have given you every herb yielding seed, which is on the surface of all the earth, and every tree, which bears fruit yielding seed. It will be your food.*

Planetary Event: Anatomically modern man

Age of universe:  $\approx 13,798,800,000$  years

When read plainly, this passage is referring to "mankind" as opposed to a specific "man" or "woman". The case is made even more pointedly in mentioning "male and female" to be clear the intended meaning was a plurality. Interestingly, this takes place within the same "yom" as the "livestock" which appears to be the mammal dominated era.



Regarding lifestyle at this time, verse 29 implies that gathering fruit and nuts and domestication of animals were the norm for early humans. Archaeologists have discovered this was the case as the hunter gatherer lifestyle was universal until the end of the last ice age.

Homo Sapiens, who is considered to be "anatomically modern man", evolved roughly 200,000 years ago. It was sometime after that date this era would have reached its end.

*1:31 God saw everything that he had made, and, behold, it was very good. There was evening and there was morning, a sixth day.*

*2:1 The heavens and the earth were finished, and all their vast array.*

2:3 God blessed the seventh [era], and made it holy,

because he rested in it from all his work of creation which he had done.

Planetary Event: The Last Glacial Period  
Age of universe:  $\approx 13,798,900,000$  years

Something that has always perplexed me is why verses 2:1-4 were part of chapter 2. Admittedly, verse 2:1 does feel thrown in, but not unlike the odd flow of 1:16b (*“He also made the stars.”*). Although it seems to interrupt the flow of the verses, it is a relevant narrative point that bridges between the 6th and 7th eras.

It is my opinion that if verse 2:1 is read independently, it may sound like the exposition for the next story. Verse 2:4 also reads like an introduction to a new section. But they would be out of sequence as the exposition would precede the introduction. In any case, it is confusing to read and deviates from the format of Chapter 1.

Reading chapter 2:1-4 as a continuation of chapter 1, it follows the same established literary pattern. What makes this era unique is that no declarations are made or actions taken but a “yom” is still observed.

My hypothesis for when this era takes place is between the dawn of anatomically modern man until near the end of the most recent ice age or glacial period.





2:4 This is the history of the generations of the heavens and of the earth when they were created,  
in the [era] that Yahweh God made the earth and the heavens.

Again, I argue that verse 2:4 is the conclusion of the creation story beginning in chapter 1. I suspect their inclusion in chapter 2 is partly due to the interruption of flow caused by 2:1 and the use of the term “generation” in 2:4.

I am not clear why “תולדות” in 2:4 is frequently translated to say, “history of the generations”. Although this is admittedly out of context, Hebrew, “תולדות” by itself translates to “history” or “chronology” which implies an arbitrary “first this then that” sequence of events. Even if appending “generations” is common in translating that verse, I argue that it implies a family or cultural lineage as opposed to a sequence of events.

To further this point, chapter 5 uses “תולדת” when referring to the “generations” of Adam. This term by itself also translates to “history” but with “begetting” and “offspring” being other English translation candidates. In that case, we are clearly referring to Adam and Eve’s descendants.

In short, the best interpretation of verse 2:4 is as the conclusion of the seven “era” long creation story sequence.

Regarding the reappearance of “Yom” (יום), this time it is also singular but in reference to the entire time period of creation overall. If the use of “yom” was a uniform period, then this verse should state the quantity of seven or at least in plural. But since the Hebrew term “yom” (יום) is not firmly time period specific it is acceptable to have one “yom” include several other “yom”.

Therefore, one can infer the meaning of "day" in Genesis 1 is not strictly 24-hour time segments, but simply a finite period of time highlighted by a particular event. This further supports a flexible interpretation of the period defined by each "Yom" being the intention of the author.

Finally, there may be a purely symbolic rationale for this creation story to be divided into 7 "yom" as it is the typical period of a quarter moon phase. The 7-day week we have today is a common practice around the world dating back to antiquity. Although this does imply a 24-hour "yom", this would provide an ideal mnemonic for an oral tradition.

This story has also doubled as scriptural support for the 6-day work week. The subdivision of creation into seven "eras" with a weekly observation based on it would have helped to preserve this story.

2:5 No plant of the field was yet in the earth, and no herb of the field had yet sprung up;

for Yahweh God had not caused it to rain on the earth. There was not a man to till the ground,

*6 but a mist went up from the earth, and watered the whole surface of the ground.*

Historical Event: End of the last ice age/glacial period  
Age of universe: ≈13,798,988,300 years (apx. 9,700 BCE)

There are those who read Genesis chapter 2 as a parallel account of the 6th “yom” as Adam is created in verse 2:6. This is credited to where verse 2:5b states, “There was not a man to till the ground”. But if one reads Verse 2:5-6 as a single statement, it is not describing the absence of humans. This exposition is establishing that, since being created, no human has been farming.

Plant cultivation was not common among early man. Although paleontological evidence shows evidence of some farming roughly 12,000 to 23,000 years ago, the largest shift towards cultivation was after the end of the last ice age. Until then, humans have been almost exclusively hunter gatherers.<sup>4</sup>

Another curiosity was the mention of no rainfall during this time. Not only is that a strange detail to include, but it is also mentioned later during Noah’s tale in chapter 7. Today even the most arid regions of the world have at least occasional or

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<sup>4</sup> Ainit Snir, Dani Nadel, Iris Groman-Yaroslavski, Yoel Melamed, Marcelo Sternberg, Ofer Bar-Yosef, Ehud Weiss. The Origin of Cultivation and Proto-Weeds, Long Before Neolithic Farming. PLOS ONE, 2015; 10 (7): e0131422 DOI: [10.1371/journal.pone.0131422](https://doi.org/10.1371/journal.pone.0131422)

seasonal rainfall, so this seems to be an entirely fictional element.

However, we cannot compare the climate of 21st century earth to that of several thousand years ago. During the last ice age it is projected that globally there was roughly 10% less rainfall than is typical today<sup>5</sup>. Although this seems like a modest difference, the large majority of falling precipitation was expected to be over the ocean. Rain over inhabited areas of land would be notably rare during this time.<sup>6</sup>

Despite this, plant life likely thrived across the inhabitable regions world. Even today there are climate regions where rainfall is infrequent, but morning dew or thick fog provides significant daily moisture.

One notable examples of this is the Sequoia National Forest in California which includes the world's tallest trees. Although annual rainfall is well below global averages, frequent fog and dew account for as much as 80% of the annual moisture accumulation in that region.

Based on our current understanding of the environment during the last ice age and the history of human plant cultivation, these few verses are a match to the culture and environment experienced by ancient cultures over 10,000 years ago.

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<sup>5</sup> NEWELL, REGINALD E., et al. "Decreased Global Rainfall during the Past Ice Age." *Nature News*, Nature Publishing Group, 3 Jan. 1975, [www.nature.com/articles/253033b0](http://www.nature.com/articles/253033b0).

<sup>6</sup> Lautenschlager, M. and Herterich, K. (2018). Atmospheric response to Ice Age conditions: Climatology near the Earth's surface - Lautenschlager - 1990 - *Journal of Geophysical Research: Atmospheres* - Wiley Online Library. [online] [Agupubs.onlinelibrary.wiley.com](http://agupubs.onlinelibrary.wiley.com). Available at: <https://agupubs.onlinelibrary.wiley.com/doi/abs/10.1029/JD095iD13p22547>

2:7 Yahweh God formed man from the dust of the ground,

and breathed into his nostrils the breath of life;  
and man became a living soul.

<sup>15</sup> Yahweh God took the man, and put him into the garden of Eden to dress it and to keep it.

Historical Event: Rosh Hashanah

Age of universe: ≈13,798,994,222 years (based on generally accepted Torra interpretation)

Again, there is the argument that if man was created on the 6th “yom”, then this story occurs at that time. I am restating (with some additional support) that chapter 2 is not a revisit to that “yom”.

"In the Midrash (Vayikra Rabba 29:1) [Talmudic commentaries from 1500 years ago], all the Sages agree that Rosh Hashanah commemorates the soul of Adam, and that the Six Days of Genesis are separate."  
-Schroeder

These commentaries confirm that the timeline of Genesis has long been a matter of theological debate spanning millennia, and I agree with their conclusion on this point. Therefore, the 6th “era” describes the creation of “mankind” along with other mammals.

What is now being described in verse 2:7 is the creation of one specific “soul”. Additionally, the description of Adam’s responsibilities assigned by God are to cultivate and protect a garden. This implies that such a practice or the method being used may have been unique at the time. In any case, being a farmer near the end of the last ice age would be rare.

As mentioned in the [Literary Structure](#) introduction, this chapter largely revolves around the creation of Adam and Eve which is the last act of the creation story. God does not make a declaration of His action in this case, but it does conclude the narrowing of literary scope.

1. The entire universe filled with the first light.
2. The condensation of nebulas that form into galaxies like our own.
3. Planetary bodies of our solar system and main sequence ignition of our sun
4. Major geological features of Earth and Vegetation
5. Sea and air creatures that would be around most of the Earth
6. Landlocked animals and then specifically mankind
7. An individual human

Adam, being the smallest narrative unit, is where the story of creation truly ends. The addition of Eve by the end of Chapter 2 is where the narrative pivots.

3:7 The eyes of both of them were opened, and they knew that they were naked.

**They sewed fig leaves together, and made themselves aprons.**

Humans and other hominidae have been using garments for at least the last 40,000 years with some evidence as far back as 650,000 years. Since humans are essentially an equatorial mammal, garments and climate controlled shelter are only necessary to survive in cooler or more temperature variable regions of the world. To this day there are still many examples around the world of human populations that live mostly without clothing.

It is my opinion that Adam and Eve would not have predated the use of clothing. But like many of the “clothing optional” cultures that still exist, knowledge of or interaction with different societies could make them self-conscious of their “nakedness”.

The significance of this passage does not seem to be related directly to clothing itself, or even implying that this was the origin of the practice. It is the philosophical failure of this new knowledge casting doubt onto their self-image and lifestyle.





5:5 All the days that Adam lived were nine hundred thirty years, then he died.

Again Hebrew leaves more room for interpretation than we would expect. Although the term “shânâh” (שנה) is largely translated as “year”, the ancient root meaning is “to repeat”. My hypothesis is that, even if our written examples of Genesis are largely accurate, the contextual usage of “shânâh” (שנה) may have culturally evolved based on the common practices at the time. Instead of referring to a solar year, “shânâh” (שנה) could have also been used in pre-flood societies to refer to a lunar month.

Since prehistoric communities were largely nomadic there would not be a reliable method for keeping an annual calendar. Living in different regions of the earth, seasons would appear differently and perhaps intermittently. Measuring the passage of time based on the moon’s phases or a quantity of “moons” was the only commonality during prehistoric times. No matter where on Earth you are, the phase of the moon is the same.

With a general lack of any other consistent method to mark time, many ancient communities even measured a person's age by “moons”. There are several documented examples of this practice in recent history.

John Brickell, *The Natural History of North Carolina* (1737), says of the "Indians" there, "They number their Age by Moons or Winters, and say a Woman or Man is so many Moons or Winters old, and so they do with all memorable actions in life, accounting it to be so many Moons or Winters since such and such a thing happened." – Sven Yargs

“In Eastern Mongolia, age is traditionally determined based on the number of full moons since conception for

girls, and the number of new moons since birth for boys.”<sup>7</sup>

There are examples of solar calendars (where a year is measured by the time it takes Earth to complete a revolution around the sun) as far back as 10,000 years ago. However, solar dating methods became more popular within only about the last 1000 years.

In all likelihood, recording ages in “moons” was common practice in prehistory, especially among nomadic communities during the ice age.

Note that one’s age in lunar cycles is about 12.36 times their age in solar years, which would make ages into the plural 100’s commonplace.

Throughout Chapter 5 of Genesis are recorded the extraordinary ages of Adam and his descendants. Although not all versions of the written Pentateuch agree on these exact values, the current Year of the Jewish calendar is in part based on the sum of these ages.

But these ages seem more pedestrian when counted in moons. For example, if Adam’s reported age of 930 is counted in “moons”, he would have lived to be a still respectable but achievable 75 years old. If the account of ages recorded throughout Genesis are largely true, I believe that “shânâh” (שָׁנָה) may have at one time referred to a lunar time scale as opposed to a solar year.

There are a few anomalies to this theory when applied to the entire list of descendants. For example, Mahalalel and Enoch each would have been only 5 “solar” years old when they first had children. But even if this list of descendants is based on

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<sup>7</sup> [https://en.m.wikipedia.org/wiki/East\\_Asian\\_age\\_reckoning](https://en.m.wikipedia.org/wiki/East_Asian_age_reckoning)

truth, the accuracy of these numbers has always been a matter of some debate. I believe that the significance of the exact ages is marginal, and Noah becoming a first time dad at 40 is a lot easier to relate to than at 500.

Even if simply dividing by 12.36 does not work out perfectly for all pre-flood ages , the practice does fit prehistoric and nomadic traditions. And as we see the ages of post-flood individuals normalize to modern day age potentials, this is likely due to the growing use of annual or seasonal calendars by the increasing numbers of agricultural and urban communities.



7:11 In the six hundredth year of Noah's life, in the second month, on the seventeenth day of the month, on the same day all the fountains of the great deep were burst open, and the sky's windows were opened.

On this surprisingly specific date, a notably rapid flood covers the world. This sensationalistic tale seems improbable in many ways. Also, there are many cultures around the world credited with having flood stories that contain similar elements.<sup>8</sup>

Although there are many who believe the Genesis flood story is a repurposed fable from other cultures, it is the very fact that so many cultures around the globe have a similar legend is precisely why it is so interesting. Even if some of the particulars are far-fetched, catastrophic floods and rising sea levels which may have submerged entire regions were at one point a shared experience around the world.

“The largest floods known to have occurred in human history are those from the end of the last ice age, between 13,000 and 8,000 years ago. As the world's great glaciers began to melt, they left large freshwater lakes behind that had been precariously confined by retreating ice dams. When those ice dams failed, the floods that resulted were almost beyond comprehension.”<sup>9</sup>

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<sup>8</sup> Public Broadcasting Service. (2021, May 11). *A flood of myths and stories*. PBS. Retrieved September 27, 2021, from <https://www.pbs.org/independentlens/blog/a-flood-of-myths-and-stories/>.

<sup>9</sup><https://www.mnn.com/family/protection-safety/photos/9-floods-of-biblical-proportion/great-floods-of-the-last-ice-age#top-mobile>

Regarding the 40 days of rainfall mentioned in this tale, "the number 40 generally symbolizes a period of testing, trial or probation"<sup>10</sup> in the Bible. One could argue that its use in this case is symbolic as opposed to literal. But as the retreat of glaciers caused worldwide flooding, there is also a shift in global air temperature and weather patterns around the world. As mentioned in my analysis of [Genesis 2:5](#), landfall rain that was rare during the ice age would become more common as these ice sheets receded.

But as for "the sky's windows" opening for an extended period of time, it is possible in our climate today for a tropical depression to last as long as three weeks. Also, if caused by a large glacial lake, the flood waters would have been a substantially different temperature to the temperate area we presume Noah would have been living in. One might even expect a large glacial lake to take several days to empty completely. Such a substantial and rapid shift in regional surface temperature is sure to induce a meteorological reaction, and it would be extended for as long as the differential persists.

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<sup>10</sup> "Meaning of Numbers in the BibleThe Number 40." *Bible Study*, <https://www.biblestudy.org/bibleref/meaning-of-numbers-in-bible/40.html>.

9:13 I set my rainbow in the cloud, and it will be for a sign of a covenant between me and the earth.

**rainbow** noun

rain·bow | \ 'rān-, bō \

Definition of rainbow (Entry 1 of 2)

1 : an arc or circle that exhibits in concentric bands the colors of the spectrum and that is formed opposite the sun by the refraction and reflection of the sun's rays in raindrops, spray, or mist<sup>11</sup>

After the rains subside, the appearance of a rainbow is introduced as a previously unobserved event. If rainfall by those living on land was scarce, so would the conditions needed for rainbows to occur. Referring again to analysis of [Genesis 2:5](#), theories on ice age weather patterns support the possibility that rainbows would be rarely observed at that time.

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<sup>11</sup> <https://www.merriam-webster.com/dictionary/rainbow>





## Final thoughts

I began this exercise to resolve my own questions regarding seemingly unresolvable differences between the scriptures and what we understand today to be empirical fact. What I outlined in this document are what I've found to be surprising similarities between today's majority scientific opinion and these stories from antiquity.

Although the scope of this analysis has been focused on these few chapters of Genesis, I believe it valuable to use similar multidisciplinary considerations in any reading of the Bible:

- Try to read every passage as if for the first time observing what is plainly being stated.
- Consider the audience, time period, language, or any other anthropological context.
- Read entire sections together in context. Avoid isolating verses and observe the literary structure.
- Leverage all knowledge, tools, and translations available.

Some may find my comments question the Bible's divine inspiration, and understandably there are several points I've questioned the accuracy of. But to the contrary, it is this same scrutiny that helped me recognize that many of these verses describe details that predate history and even humanity. That there appear to be scientifically congruent illustrations in the Bible beyond the possibility of direct observation only serves to further strengthen my views on its relevance.

Furthermore, I challenge anyone to contest the validity of my analysis. This is not out of hubris, but out of the desire to expand understanding. It is only through testing our hypotheses that they can become working theories.

For those concerned with creating their own crisis of scripture, key truths expressed plainly in the Bible (Matthew 7:12, for example) are durably apparent in any interpretation. But it is in finding a personal relevance in the Bible's illustrations which is of the greatest value.

My hope is that contemporary analyses such as this might resolve some debate over such derided passages and encourage a more contextualized reading of the Bible as a whole.