

## **Reconciling the Genesis creation account with science**

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In my last article 'The DAYS of Genesis creation account' I suggest that the 'days' are in fact great creative periods, NOT 24 hour earth days.

This leads us to the next important question. We look at the Genesis account and discuss whether the described order of creative events can be reconciled with the discoveries of science.

I approach this subject in the following way.

1. I describe the major changes that science tells us took place during the history of our earth.
2. These major events are compared with the events described in the Bible Genesis account, as shown in most English language translations.
3. Apparent differences between the scientific account and Genesis account are listed.
4. Reconciling these apparent differences.

### **1. Major changes over time: according to science**



Our earth was formed by many meteors and comets crashing together over millions of years. Science does not know how long this process took but there is evidence that the early earth was very hot due to these collisions.



However, by about 4.4 billion years ago it had cooled a lot and was covered by very hot and salty water. It was a water world and little if any land was above sea level. This hot sea resulted in an atmosphere of dense clouds. The cloud layer was at first so dense that the sun's light did not penetrate to the ocean surface.

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As the earth slowly cooled the processes of plate tectonics caused parts of the ocean floor to be pushed upwards and this resulted in a large continent called Pangaea about 335 million years ago. This initially barren land enabled fresh water to form in lakes and rivers, coming from rain and condensing mist. Before there was land all the earth's water was very salty like today's oceans.

The first life was unicellular and existed in water. Some scientists believe that the life was in the salty ocean but recently considerable evidence is suggesting it may have first appeared in fresh water on land (Mulkiđjanian. A ,et al 2012).



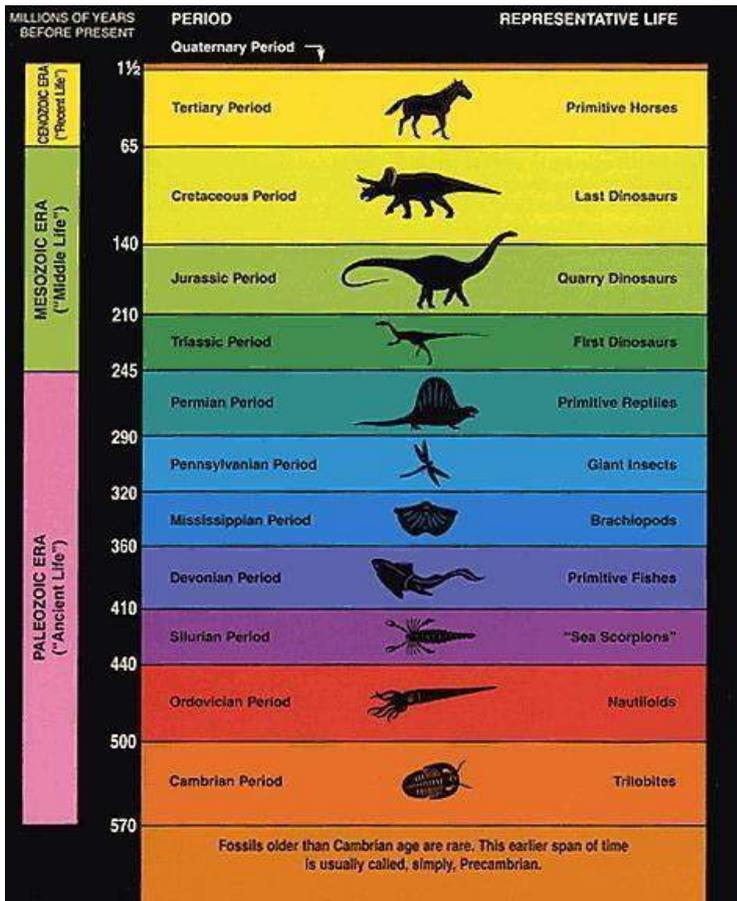
The appearance of land and fresh water created an ideal environment for plant life. Genetic studies have shown that all plant life existing today on land originated from this filamentous chlorophyte alga that grew in fresh water.

Recent research by a team of geneticists suggests that land plants appeared much earlier than previously thought and possibly even before the Cambrian period when animal life first appeared in great numbers and variety in the sea.

An extensive study by Morris and a team of researchers (2018) presents evidence that land plants first appeared in the Cambrian period. This coincided with the massive proliferation of animal life in the sea during the so-called 'Cambrian Explosion'.

According to science, the early earth atmosphere contained nearly no oxygen. However, over millions of years the complex biological process of photosynthesis produced the atmospheric oxygen needed by complex life forms. This process of oxygen formation started with some unicellular organisms in the sea but greatly accelerated once plants covered the land.

The appearance of abundant vegetation on earth not only led to increased oxygen in the air but also to dissolved oxygen in the sea. It is therefore not surprising that the fossil record shows a dramatic appearance of many different sea creatures at the same time as the land was first covered with vegetation during the Cambrian geological period.



Once the earth contained multi-cellular creatures some of them became fossilised. These fossils have enabled science to determine sequences of increasing complexity of life.

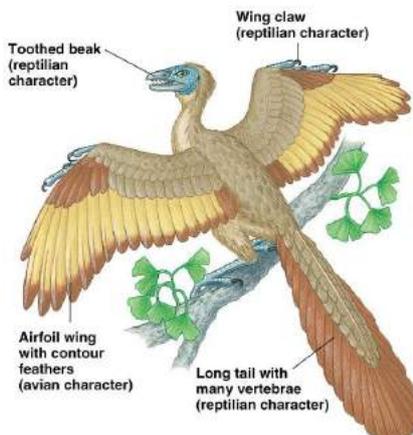
The oldest rocks contain only relatively simple life fossils. More recent rocks contain fossils of more complex creatures.

The numbers shown at left on this diagram give ages in millions of years.

For instance, The Devonian period that is also sometimes referred to as the age of fishes, took place between 410 and 360 million years ago.



The first flying creatures were insects. These appeared in great abundance during the Devonian period about **400 million years ago** (Misof et al 2014).



The first fossils of modern type birds come from about **35 million years ago**, although the fossil of *Archaeopteryx* comes from rocks dated at about 150 million years old.

We have several *Archaeopteryx* fossils that show they had feathered wings and other bird like features but also reptilian features like teeth. **Clearly birds appear in the fossil record long after the existence of flying insects and long after appearance of other large land animals** (Chiappe (1995).

## 2. Comparing the scientific order of events with the Genesis order

If we look at the order of events as seen in most English translations of Genesis, we encounter possible conflicts with science. The following table shows where apparent conflicts occur. After this we will look at the original Genesis text and see how legitimate alternative translations of the Hebrew can lead us to reconciling these apparent conflicts. Bible quotations from NIV version unless otherwise stated.

Major stages on earth <b>according to science</b>	Major stages on earth <b>according to Genesis</b> (NIV version)
Very hot beginning. No condensed water on surface	No comment on beginning process 'God created the heavens and earth'.
Later. Ocean over whole earth Thick cloud cover and darkness above the ocean.	'Spirit of God was hovering over the waters and 'darkness was over the surface of the waters'
As earth cooled further the cloud canopy thinned and sunlight started to penetrate down to the ocean.	And God said "Let there be light" and he separated the light from the darkness He called the light "day" and the darkness he called "night" <u>(Day 1)</u> .
As the earth cooled further and the cloud cover became thinner, more often the clouds were higher and a space developed between the sea and clouds. The space was between water in the sea and water in the clouds.	And God said "Let there be an expanse between the waters to separate water from water". And God called the expanse "sky" <u>(Day 2)</u> .
Plate tectonics resulted in parts of the ocean floor being pushed upwards to form land above the sea.	And God said " Let the water under the sky be gathered to one place and let dry ground appear" God called the dry ground "land" and the gathered waters he called "seas" <u>(Day 3)</u> .
Soon after land appeared above the ocean this produced areas of fresh water and the stage was reached when plant life could thrive and rapidly diversify.	Then God said " Let the land produce vegetation: seed-bearing plants and trees on the land that bear fruit with seed in it, according to their various kinds" <u>(Day 3)</u> .

As the earth cooled further there were more frequent breaks in the cloud cover. Any observer on earth would have started to see the sun, moon and stars.

And God said “Let there be lights in the expanse of the sky to separate the day from the night, and let them serve as signs to mark seasons and days and years, and let them be lights in the expanse of the sky to give light on the earth” And God made two great lights – the greater light to govern the day and the lesser light to govern the night. He also made the stars (Day 4).

The first vertebrate creatures suddenly appeared in great diversity and abundance in the waters. This took place in the Cambrian period, between 570 and 500 million years ago. A bit later insect life appeared in great diversity and led to many species of flying insects over the land.

And God said “Let the water teem with living creatures, and let birds fly above the earth across the expanse of the sky” (Day 5).

Land based vertebrate creatures only appeared after the explosion of life that took place in the waters.

And God said “Let the land produce living creatures according to their kinds: livestock, creatures that move along the ground and wild animals, each according to their kind” (Day 6).

Higher primates and mankind only appeared on earth after all the other animals.

Then God said “Let us make man in our image, in our likeness, and let them rule over the fish of the sea and the birds of the air, over the livestock, over all the earth, and over the creatures that move along the ground” (Day 6).

### **3. Possible differences between scientific and biblical accounts**

In ‘Day 2’ the Genesis account speaks of separating the waters above from the waters below. In the original Hebrew the wording is more like the Septuagint version of the Bible and also in some other translations. It says, *Let there be a firmament in the midst of the water, and let it be a division between water and water, and it was so. And God made the firmament and God divided between the water which was under the firmament and the water which was above the firmament.* (Genesis 1:6-7).

Some commentaries have suggested that the writer of Genesis was expressing a view held by people at the time, that there was a solid dome over the earth above the air and that there was water above that solid dome (firmament). The idea was that the stars and sun were fixed in that firmament. We ask whether that was the understanding of the Genesis account? Some ancient cultures apparently thought rain came through holes in the firmament.

**In 'Day 3'** of the Genesis account the described vegetation includes trees and flowering plants with fruit and seed. The scientific account tells us that the first vegetation was without flowers or fruit.

**In 'Day 4'** the Genesis account seems to suggest that the sun, moon and stars were only created at this time but science tells us that the sun, moon and stars were created long before this time.

**In 'Day 5'** the Genesis account seems to speak of birds just after the appearance of abundant sea creatures. Science tells us that birds only appeared much later in the history of life and the only flying creatures at that time were insects.

#### **4. How to explain away these potential contradictions?**

##### **Explaining Day 2**

Archaeological discoveries confirm that some ancient cultures believed in a solid dome (firmament) above the sky and that rain came through holes in this solid dome. However, in most Bible references referring to rain it is clear that the writers understood that it came from clouds, not from holes in a firmament. For instance, passages such as Psalm 77:17, Proverbs 3:20, Isaiah 5:6 and numerous other scriptures.

In Genesis 1:8 we read '*God called the firmament heaven (Hebrew Shamayin)*'. It is important to note that this word 'shamayin' is also associated with 'air'. The word is translated elsewhere in the Bible as 'heaven' (388 times) and as 'air' (21 times).

It is therefore acceptable to consider that Genesis Day 2 is describing creation of a space (air), between the ocean waters and the water in the thick cloud canopy. In other words the creation of an atmosphere in which flying creatures could fly. Day 2 is describing the time when the earth had cooled further and the clouds had thinned and they were no longer so thick and no longer extended right down to the surface of the ocean.

##### **Explaining Day 3**

The first important step towards understanding the Genesis creation 'days' is to accept that these can be understood to be 'ages of time', not 24 hour days (see my previous article).

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The second important step is to understand that God has created life with the ability to change over time. Day 3 is describing the major events that led to earth becoming suitable for land vegetation. The diversification of plants after this time was only possible because of these major changes on earth. Day 3 is talking about the dramatic appearance of vegetation and this would inevitably lead to all the diversity that we see around us today.

This also tells us that the Genesis account is a combination of describing actual events and making prophetic pronouncements. The prophetic pronouncement tells us that these major creative 'ages' will inevitably lead to increasing complexity of vegetation and other changes during the next great creative 'ages', namely during the Genesis Days 4 to 6.

### **Explaining Day 4**

The Genesis account tells us that 'God made two great lights', namely the sun and moon. However, the Hebrew word used here for 'made' is 'asah'. This word can be translated in many ways. For instance, 'asah' is translated elsewhere in the Bible as 'bring forth'(10 times), ordain (5 times), perform (18 times). Most often it refers to something made from pre-existing things. For instance 'Adam made (asah) fig leaf clothing to cover his nakedness (Genesis 3:7) and God 'made' (asah) coats of skins (Genesis 3:21).

In other words Day 4 is not describing the creation of the sun, moon and stars. It is describing the time on earth when thinning of the clouds enabled any creatures with eyes to see these heavenly bodies. They now became available for determining times and seasons. We know that many creatures use phases of the moon, seasonal changes and even star patterns to time breeding seasons and to direct migrations. The sun, moon and stars were now '**appointed to a function**' in relation to life on earth.

In addition, the existence of the sun before Day 4 is clearly implied in the Day 1 account of separating the day from the night. The sun could not be seen at the early stages, due to the thick cloud cover, but as the cloud layer thinned over time some of its diffused light could penetrate the cloud cover and enable distinguishing between day and night.

### **Explaining Day 5**

When some translations of the Genesis account describe 'birds flying above the earth across the expanse of the sky', the Hebrew word translated as 'birds' is OPH. In other places the same word is translated as 'flying creatures'. The fact that it does not here describe birds is seen from the following three considerations:

- a. Elsewhere in Genesis chapters 1 to 3, **birds are always described in the original Hebrew as 'Fowl of the air'**. This description of birds is found in Genesis 1:26, 1:30, 2:19 and 2:20.
- b. The Genesis Day 5 mention of the flying OPH does not describe them as 'fowl of the air' but merely as 'flying creatures' (not birds).
- c. Elsewhere in the Bible the word OPH is used to describe insects. For instance, in the Bible books of Leviticus and Deuteronomy we read, *all flying insects (oph) that walk*

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*on all fours are to be detestable to you. There are, however, some winged creatures (oph) that walk on all fours that you may eat, those that have jointed legs for hopping on the ground ... any kind of locusts, katydid, cricket or grasshopper (Leviticus 11:21-23) and similar in Deuteronomy 14:19.*

From the above considerations we can legitimately interpret the Day 5 reference to 'Flying creatures' (OPH) as referring to the first creatures that could fly, namely the insects. Therefore, no conflict here with science.

## **A new look at the Genesis creation account**

In the following translation of Genesis chapter 1, I take note of the many times the wording includes phrases such as 'let the earth bring forth' , 'let there be' 'let the land produce vegetation'. These **words are very suggestive of processes, not instantaneous events!**

Also bear in mind that the account includes **two Hebrew words for 'made' or 'create'** namely 'asah' and 'bara'. The word 'bara' relates to making things out of something that cannot be seen. It is used in Genesis 1:1, *In the beginning God created (Bara) the heavens and the earth.* This is also stated in Hebrews 11:3 *By faith we understand that the worlds were framed by the word of God, so that the things which are seen were not made of things that are visible.* Also in passages such as Isaiah 42:5, *This is what God the Lord says – he who created (bara) the heavens and stretched them out.* What a great description of the Big Bang creative event and the following expansion of our universe!

The creative word 'asah' refers to making things from pre-existing materials but the word has several other meanings that are used in various Bible passages.

The word BARA is only used in the creation account:

1. For the initial creation of heaven and earth.
2. Creation of great sea creatures and everything living that moves in the sea (Day 5)
3. In the creation of mankind. However, with mankind the account states that mankind were **made** (asah) and **created** (bara). This is a clear reference to God forming (asah) our bodies from pre-existing material (dust of the earth) and breathing into us his Holy Spirit (bara). Adam and Eve were the first humans to receive the Holy Spirit. They became a New Creation, just as we all become New Creations in Christ Jesus when we are 'born again' by the Spirit of God (2 Corinthians 5:17).

We also look at the word '**good**' as used in Genesis chapter one. The Hebrew word is 'tob' and in some Bible passages it is translated as 'better' (71 times). In the Genesis account God looked at his creation and said "It is good". I suggest that the account is saying 'it is good for its purpose', not meaning a moral 'goodness'. Each creative AGE is better than the previous ones because the earth is becoming closer to its main conclusion, namely the creation of mankind.

As a zoologist, I also know that God created life to be mortal. All creatures die, as revealed in the fossil record, and the balance of nature is maintained by food chains where there are

predators and prey. In other words, the 'goodness' spoken about in Genesis chapter one is not saying that living creatures were created immortal. Physical death has been part of nature from the beginning.

In the following suggested translation of Genesis chapter one I have not continued into chapter 2 because that will be the subject for my next article. That article will look at who was Adam and how does the Garden of Eden account relate to creation and how does it link with the rest of the Bible.

In the following translation of chapter 1, I have added some explanatory notes within brackets.

### **A suggested amplified translation of Genesis Chapter 1**

In the beginning God created (bara) the heavens and the earth. The earth was initially formless (without a variety of features) and empty (no life), darkness was over the surface of the deep ocean and the Spirit of God was brooding over the waters.

**And God said**, "Allow light to appear on earth", and light became visible. God saw that the light was good, and he separated the light from the darkness. God called the light "day" and the darkness he called "night".

That was the ending of the first creative AGE and the promise of a new one.

**And God said**, "Let there be an open atmosphere between the waters to separate water from water" So God made (asah) the open atmosphere and separated the ocean water below from the water in the clouds above. And it came to be so. God called the open atmosphere "sky".

That was the ending of the second creative AGE and the promise of a new one,.

**And God said**, " Allow the waters of the ocean to no longer cover the whole world and allow dry ground to appear above the waters" And it came to be so. God called the dry ground "land" and the gathered waters he called "seas". And God saw that it was good (suited for its purpose).

Then God said, "Allow the land to bring forth vegetation: seed-bearing plants (with methods of reproduction) and trees on the land that bear fruit with seeds for reproduction, according to their various kinds". And it came to be so. The land produced vegetation, plants bearing means of reproduction, according to their kinds and trees bearing fruit with seed accordance with their kinds. And God saw that it was good.

That was the ending of the third creative AGE and the promise of a new one.

**And God said**, "Let there be lights in the heights of the sky to separate the daylight from the night, and let them serve as signs to mark seasons and days and years, and let them be lights in the heavens to give light on the earth" And it came to be so. God ordained (asah) two great lights – the greater light to govern the day and the lesser light to govern the night.

He also ordained (*asah*) that the stars will be visible. God set them (sun & moon) in the heavens to give light on the earth, to govern the day and the night, and to separate light from darkness. And God saw that it was good.

That was the ending of the fourth creative AGE and the promise of a new one.

**And God said**, “Allow the water to teem with living creatures, and let flying creatures (insects) fly above the earth across the atmosphere”. So God created (*bara*) the great creatures of the sea and every living and moving thing with which the water teems, according to their kinds, and every insect according to its kind. And God saw that it was good. God blessed them and said, “Be fruitful and increase in numbers and fill the water in the seas, and let the flying creatures increase on the earth”.

That was the ending of the fifth creative AGE and the promise of a new one.

**And God said**, “Allow the land to produce living creatures according to their kinds: livestock, creatures that move along the ground and wild animals, each according to its kind”. And it came to be so. God made (*asah*) the wild animals, each according to their kinds, the livestock according to their kinds and all the creatures that move along the ground according to their kinds. And God saw that it was good.

Then God said, “Let us make (*asah*) mankind in our image, in our likeness, and allow them to rule over the fish of the sea and the birds of the air, over the livestock, over all the earth, and over the creatures that move along the ground.

So God created (*bara*) mankind in his own image, in the image of God he created (*bara*) them; male and female he created (*bara*) them.

God blessed them and said to them, “Be fruitful and increase in numbers; fill the earth and subdue it (bring it under your control). Rule over the fish of the sea and the birds of the air and over every living creature that moves on the ground”.

Then God said, “Your food will come from seed-bearing plants on the face of the whole earth, and from trees that have fruit with seed in it. And to all the beasts of the earth and all the birds of the air and all creatures that move on the ground- every creature that has the breath of life in it, I give every green plant as food”. And it was so.

God saw all that he had made (*asah*) and it was very good (ideally suited for its purposes).

That was the ending of the sixth day and the promise of another.

## **Conclusions**

The Genesis creation account is an amazing document that summarises the changes that took place on our world over millions of years. Although it was written long before our scientific age, it is in remarkable agreement with the order of events being revealed to us through the discoveries of science. How did the original human author gets the facts right?

The account has been relevant to people in all ages, but today we have to take note of what God is telling us through the discoveries of science. If we listen to this ‘voice of God’ speaking to us through his creation, then we discover the details given in Genesis can be fully reconciled with scientific discovery.

I believe Genesis chapter 1 is an excellent example of how the Creator at times inspires human authors to write truths that they do not themselves understand.

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### **My previous articles with relevance to this article:**

[The age of our world](#)

[The DAYS of Genesis creation account](#)

[Evidence against a world-wide flood](#)

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