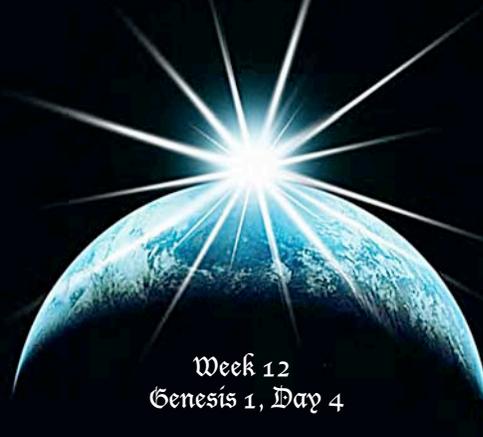


# Science and the Bible

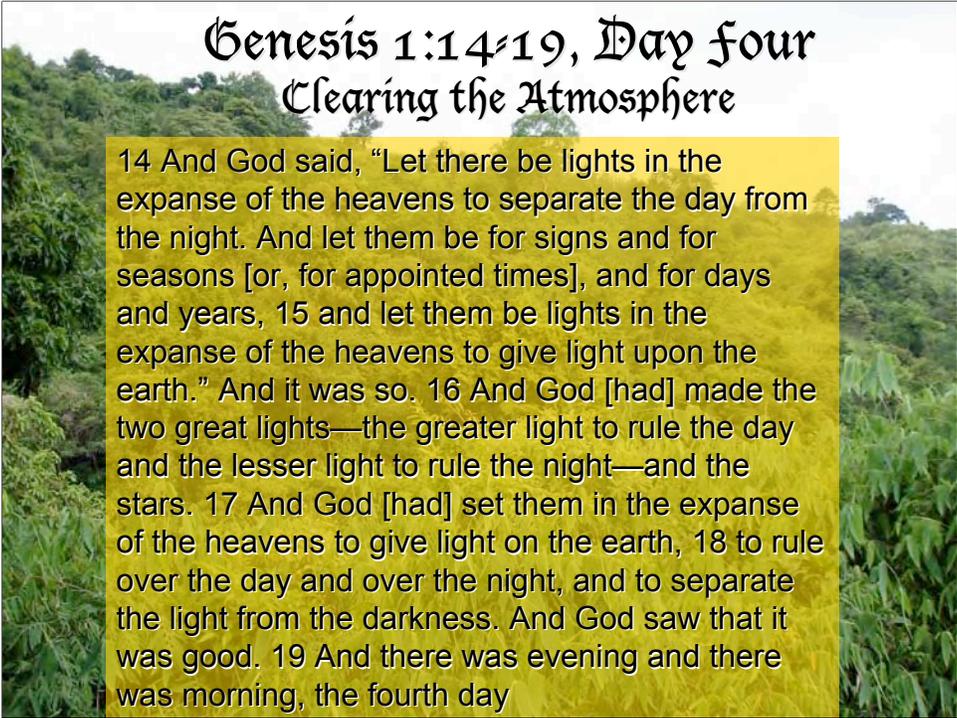
A Course of Study  
by  
Dr. David C. Bossard  
Winter, 2008 (Continued)



Week 12  
Genesis 1, Day 4

This is week 12 in a course of study in Science and the Bible.

We will look at Day 4 and perhaps get started in Day 5.



## Genesis 1:14-19, Day Four Clearing the Atmosphere

14 And God said, "Let there be lights in the expanse of the heavens to separate the day from the night. And let them be for signs and for seasons [or, for appointed times], and for days and years, 15 and let them be lights in the expanse of the heavens to give light upon the earth." And it was so. 16 And God [had] made the two great lights—the greater light to rule the day and the lesser light to rule the night—and the stars. 17 And God [had] set them in the expanse of the heavens to give light on the earth, 18 to rule over the day and over the night, and to separate the light from the darkness. And God saw that it was good. 19 And there was evening and there was morning, the fourth day

If we follow the interpretation of Dr. Newman and others, the Sun, Moon and Stars already are shining since Day 1, but there is a dense cloud covering the entire earth so that, while light and darkness could be sensed, the Sun, Moon and Stars were not visible. The clouds were caused by a tremendous amount of volcanic ash thrown up into the stratosphere, as well as dense rain clouds.

Over time, the atmosphere cleared up, and the "lights" became visible. Once they are visible, it is possible to follow their

## Genesis 1:14-19, Day Four Clearing the Atmosphere

What to make of light in Day 1 but the Sun in Day 4?

Augustine (c.400 A.D.): (¶ I.11.23) *What is the connection between the light of v. 3 and the lights of v. 14? "Why was the sun made to rule the day and shine upon the earth if that other light [of day 1-dcb] was sufficient to make the day?...One might say that the brightness of day was increased by the addition of the sun, supposing that there had been a day illuminated by the previous light, but less brilliantly than it now is.*

Another theory has been proposed by a certain writer, [that] light was first brought on the scene in the work of creation, as indicated by the words, '*Let there be light,*' ... but afterwards, when mention is made of the heavenly bodies, we are told what was made out of the light." [recall that Augustine believed in instantaneous creation]



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## Genesis 1:14-19, Day Four Clearing the Atmosphere

### Lights in the firmament as signs

Augustine (c.400 A.D.): (¶ II.14.28) "There is obviously a good deal of obscurity if we take this to mean that time began on the fourth day, as if the preceding three days could have passed without a lapse of time."

29. "What signs are meant when God says of the stars, *Let them serve as signs*? He surely does not mean the signs that foolish men observe, but those that are useful and necessary for practical purposes, such signs as mariners watch in steering their ships, or men in general when they provide for changes in climate through summer and winter and autumn and spring. ... The fixed hours, days, and years with which we are familiar could not be without the motions of the heavenly bodies. ... Years are of two kinds. There are the ordinary years marked by the revolution of the sun, not when it returns in its daily round to the east, but when it comes again to the same position it previously occupied among the stars. This happens after the passing of 365 days and six hours. This fraction, when multiplied by four, makes necessary the insertion of one day, in order to make our reckoning of time correspond once more with the revolution of the sun. There are also the mysterious greater years that are said to have passed when the other stars have completed their courses. [Precession of the equinox 25,768 years -dcb].

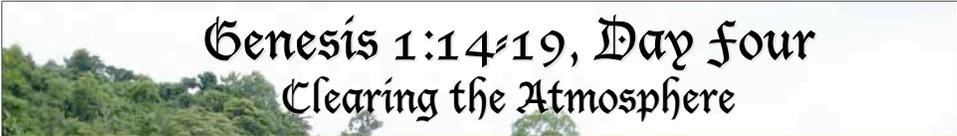
The ancients around 350 BC already knew about the length of a year -- 365 days 6 hours 11 min, which is in error by about 2 minutes.

Hipparchus

Ptolemy (c. 87 - c.150) estimated the "greater year" as about 36,000 years. He got this by noting the change between his sky charts and that of Hipparchus,

after a lapse of 265 years. Polar star (Polaris) slowly as the earth's axis "wobbles" and will return to Polaris in 25,768 years. This precession was known

very likely known to Augustine.



## Genesis 1:14-19, Day Four Clearing the Atmosphere

### The Moon as "Lesser light"

Augustine (c.400 A.D.): (¶ II.15.30) "Concerning the shape of the moon at its origin, many scholars engage in prolonged discussions. Would that they spoke as seekers rather than posed as teachers!"

31. "[The moon] has its entire mass and its proper round shape undiminished, even when it shines towards earth in the shape of a horn while waxing or waning. If, then, the light in it increases or is perfected or is diminished, it is not the heavenly body itself that changes but the illumined surface of it [reflected sunlight - dcb] ... When it is near the sun it can appear only in the shape of a horn, because the rest of it, which is fully illumined, is not facing the earth so as to be seen from here. It is only when it is opposite the sun that the whole of its illumined surface is visible to us."

34. "...[skeptics] will certainly grant this at least to our eyes, that these two lights obviously shine more brightly upon earth, that day is illumined only by the light of the sun, and that night with all its stars does not shine as bright without the moon as when lighted by her rays."

Augustine cites the view that the moon reflects light from the sun, and hence is "lesser."

and comments on the statement that the Moon illuminates the night.

## The Acts of Forming and the Acts of Filling

Dallas Cain, *And It Was So*, Chapter 6

<i>Forming</i>	<i>Filling</i>
<p style="text-align: center;"><b>Day One</b></p> <p style="text-align: center;"><b>God said, "Let there be daylight"</b></p> <p>and there was daylight . . . and God separated the daylight from the darkness to create day and night.</p>	<p style="text-align: center;"><b>Day Four</b></p> <p style="text-align: center;"><b>God said, "Let there be lights in the expanse of the sky . . ."</b></p> <p>God had made two great lights . . . and the stars. He had given them in the expanse of the sky.</p>
<p style="text-align: center;"><b>Day Two</b></p> <p style="text-align: center;"><b>God said, "Let there be an expanse between the waters to separate water from water."</b></p> <p>God separated the waters below from the waters above to create the oceans and the sky.</p>	<p style="text-align: center;"><b>Day Five</b></p> <p style="text-align: center;"><b>God said, "Let the water teem with living creatures, and let winged creatures fly in the sky."</b></p> <p>And God created the creatures of the sea and the creatures of the sky.</p>
<p style="text-align: center;"><b>Day Three</b></p> <p style="text-align: center;"><b>God said, "Let the water under the sky be gathered together to let the dry land appear."</b></p> <p>And it came to be so. God called the dry "land" and the gathered waters he called "seas."</p> <p style="text-align: center; margin-top: 20px;"><b>God said, "Let the land produce vegetation."</b></p> <p>The land produced vegetation.</p>	<p style="text-align: center;"><b>Day Six</b></p> <p style="text-align: center;"><b>And God said, "Let the land produce living creatures."</b></p> <p>God made the wild animals and livestock and all the creatures that move along the ground.</p> <p>Then, as a special subset of the land-dwelling creatures:</p> <p style="text-align: center; margin-top: 10px;"><b>God said, "Let us make humans in our likeness."</b></p> <p>So God created humans in his likeness.</p> <p style="text-align: center; margin-top: 10px;"><b>God said, "And to all creatures that have the breath of life in it I give every green plant for food."</b></p> <p>And it came to be so.</p>

One viewpoint is that the creation days are given in two sets of three days, and the correspondance is as shown here.

I don't much like this view because it seems to imply that the days are just a formal structure. Recall Augustine had the

Notion that the days are "topical" days.

In this view the first three days are "days of forming" and the next three days are "days of filling."

## Genesis 1:20-23, Day Five: Creation of Sea and Air Animals



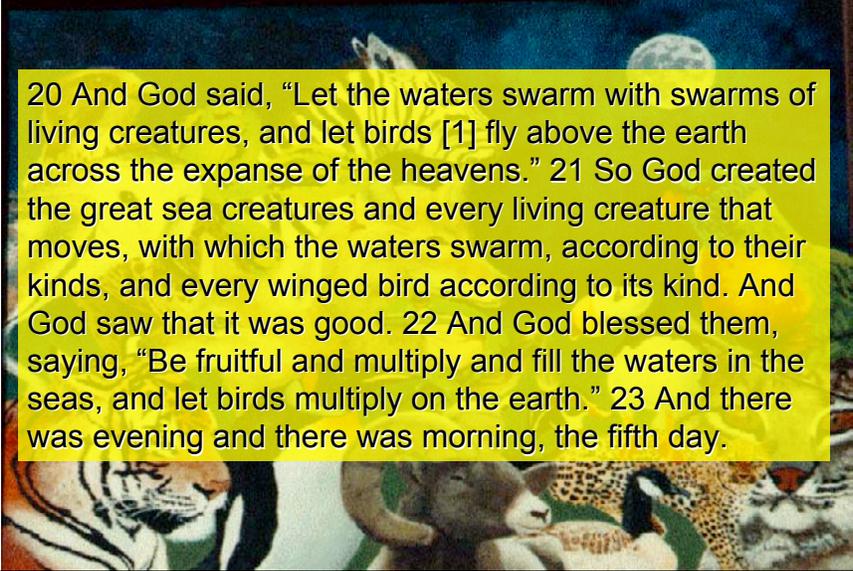
Days five and six concern the creation of sea, air and land animals.

As we noted last week, animal life differs from plant life by the use of certain genes, called the homeobox or hox genes, which use a body plan. Plants do not have detailed body plans controlled by genes. At least, that is the current thinking about what distinguishes plants from animals. This makes animal growth and development more complex than plant development.

For example, many animals have a left-right symmetry that involves non-adjacent body parts. Plants have a kind of symmetry but it is mostly seen by the form of a single part -- such as a leaf -- or determined by the requirement for balance and stability -- such as the branches that grow from a stem or trunk.

Many parts of animal bodies are a complex combinations of a body plan -- legs, arms, wings, etc. They are formed by a whole package of genes that are expressed in a controlled sequence.

## Genesis 1:20-23, Day Five: Creation of Sea and Air Animals



20 And God said, "Let the waters swarm with swarms of living creatures, and let birds [1] fly above the earth across the expanse of the heavens." 21 So God created the great sea creatures and every living creature that moves, with which the waters swarm, according to their kinds, and every winged bird according to its kind. And God saw that it was good. 22 And God blessed them, saying, "Be fruitful and multiply and fill the waters in the seas, and let birds multiply on the earth." 23 And there was evening and there was morning, the fifth day.

The word translated "birds" in verse 20 is a more general Hebrew word meaning just "flying creatures." This term would cover insects as well as what we think of as birds. And in fact, insects are very important in creation, because they are important in plant polination.

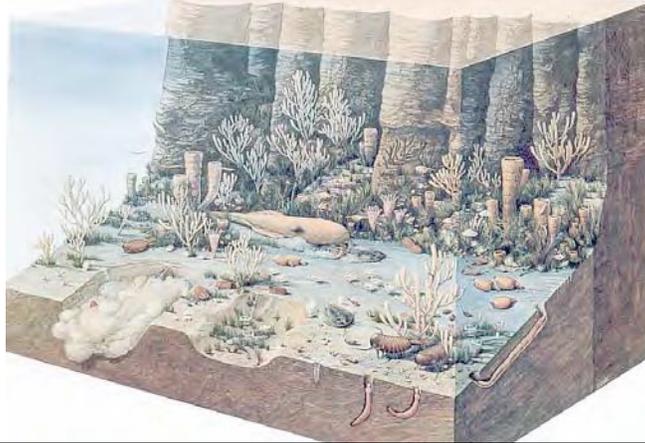
So verse 20 is general terms for sea creatures -- from plankton to whales -- and for flying animals.

Verse 21 focuses more specifically on the large sea creatures -- perhaps whales or even aquatic animals such as crocodiles (for example the monsters (dragons?) of Job 41 -- see also Job 7:12 and Psalm 74:13, Leviathan of Job 3:8, Ps. 104:26; dragon Isa 27:1)

Some people have suggested that here Moses is making the point that the fearsome giant sea creatures which the pagan nations worship as gods, are created by God (to the extent that they are real and not just mythological).

## Genesis 1:20-23, Day Five: Cambrian Explosion

All body plans (phyla) appear suddenly at  
(almost) the same time in the fossil record.



Genesis 1:20-23, Day Five:  
Cambrian Explosion

Example of segmented body plan  
Trilobite



# Topics for discussion

- More on body plans
  - the 39 phyla
  - all suddenly appear in the fossil record "Cambrian explosion"
  - body segments
  - experiments on hox genes -- growing legs, eyes and antennae
- Yes - there is a progression of complexity,  
but ALL life is exceedingly complex!!!