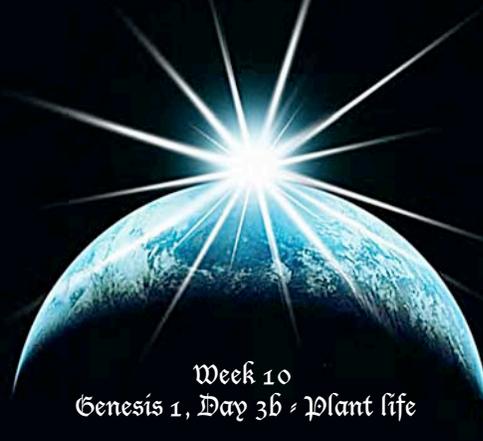


Science and the Bible

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



Week 10
Genesis 1, Day 3b - Plant life

This is week 10 in a course of study in Science and the Bible.

We will continue our discussion of Day 3 and the creation of plant life.

Genesis 1:9-10, Day Three, Part 1:

What has happened so far?

- Day One -- Light and Darkness
 - Inflation period in the early universe
 - Position of Solar System in the Galaxy
- Day Two -- Atmosphere
 - Waters below: ocean covering the earth
 - Waters above: clouds (obscuring the sun)
- Day Three, part 1 -- *Stable* Dry Land
 - Tectonic Plate movement
 - Separation of lighter from heavier rocks
lighter dry land "floats" on denser crust

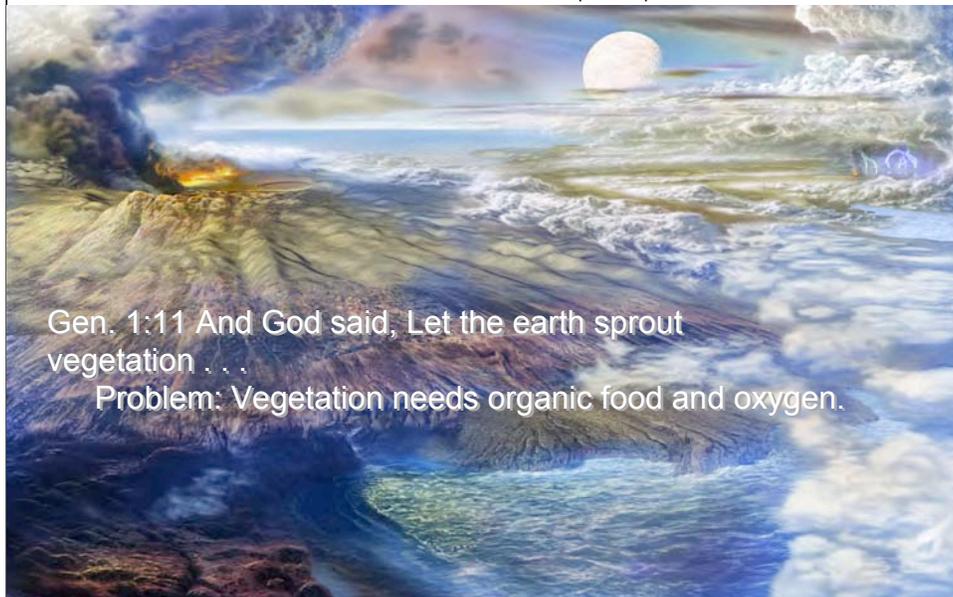
Let's begin by reviewing where things are up to this point.

On Day one, God created light and darkness. From the viewpoint of modern physics, the universe would never have happened if God hadn't made darkness.

This is called the inflation period in which the universe suddenly expanded at a rate much higher than the speed of light, causing gaps of darkness in the energy of the newly created universe.

I might also observe that from the

Genesis 1:11-13, Day Three, Part 2: The Creation of Life



So now we are ready to create the first life. The first life is vegetation -- plants that provide food for the animals that God will create later.

There is one problem, which we discussed briefly at the end of the last class: all plants require organic food

(that is, food that has been prepared by other living matter). Very few plants, and they are mostly microscopic,

can make all of their food from inorganic material -- the things that the bare earth can provide.

Genesis 1:11-13, Day Three, Part 2: The Creation of Life



Why do plants and animals need organic food? The answer revolves around the complexity of life itself. A plant or animal has so many routine tasks to do that it can't take the time or energy, literally, to do all of the work needed to create food from inorganic matter. Only very simple single-celled life can afford to do the needed work, and that is only because these simple forms of life don't have as much to do as something as complex as a plant or animal.

Genesis 1:11-13, Day Three, Part 2: The Creation of Life

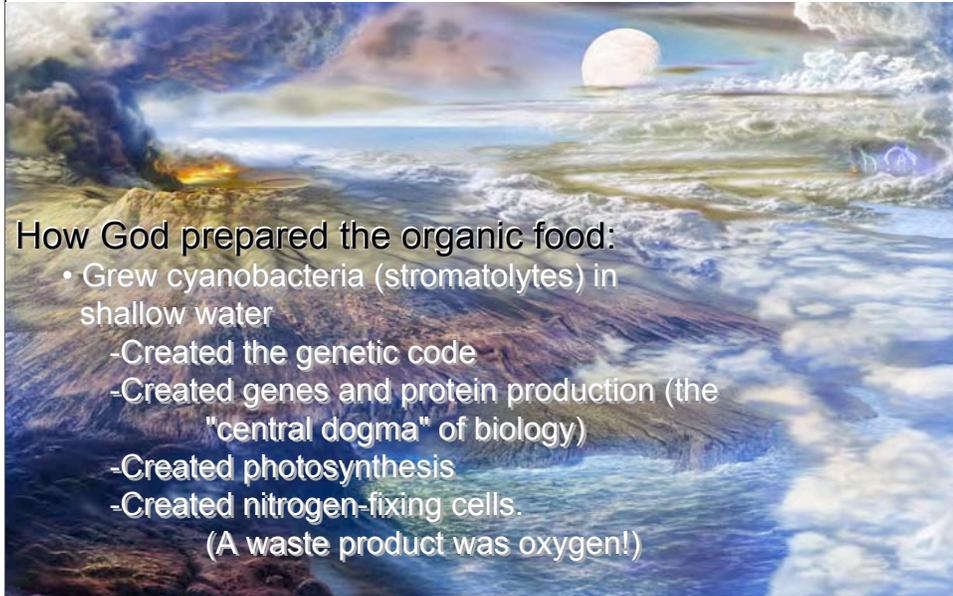


Nitrogen is one of the most basic materials of life -- next to carbon and water. Nitrogen is used in all of the genetic material, and in the amino acids, the building blocks of all proteins. Without nitrogen in a form that is available for use, life cannot exist.

Here is an irony. It's the "available for use" that is the catch. Nitrogen is all around us - - the atmosphere is about 78% nitrogen -- and has been since it first formed.

But nitrogen gas is unavailable to life because the gas molecule is very hard to pull apart. To do this takes so much

Genesis 1:11-13, Day Three, Part 2: The Creation of Life

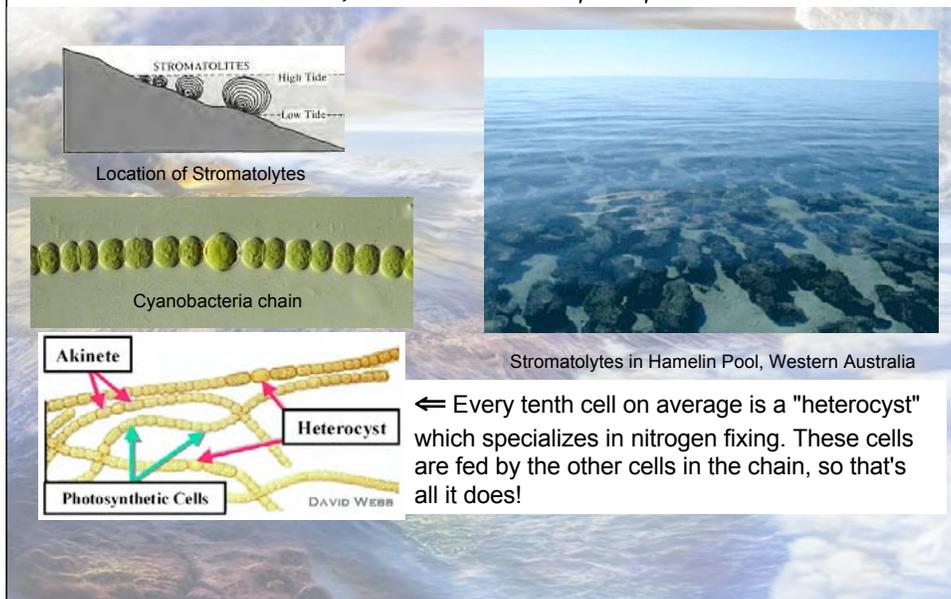


How God prepared the organic food:

- Grew cyanobacteria (stromatolytes) in shallow water
 - Created the genetic code
 - Created genes and protein production (the "central dogma" of biology)
 - Created photosynthesis
 - Created nitrogen-fixing cells.
(A waste product was oxygen!)

So what is the solution? Almost as soon as the earth had cooled, God created the first life.

Genesis 1:11-13, Day Three, Part 2: The Creation of Life



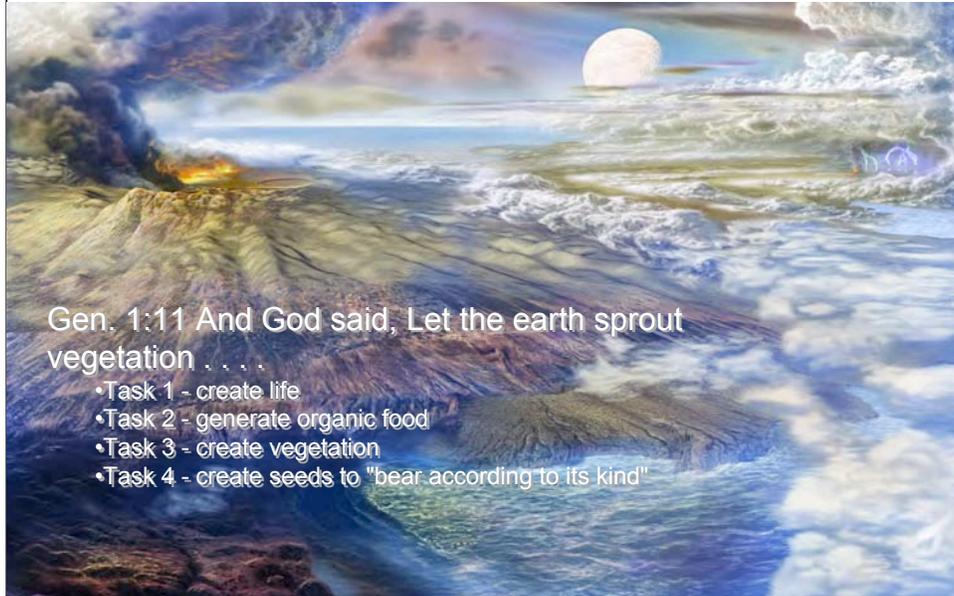
So what is the solution? Almost as soon as the earth had cooled, God created the first life. The first life was cyanobacteria, which use photosynthesis

to convert sunlight into energy. They are single-celled bacteria that live in colonies called stromatolytes. They live in shallow tidal waters. Some of the

bacteria, called "heterocysts", specialize in nitrogen-fixing.

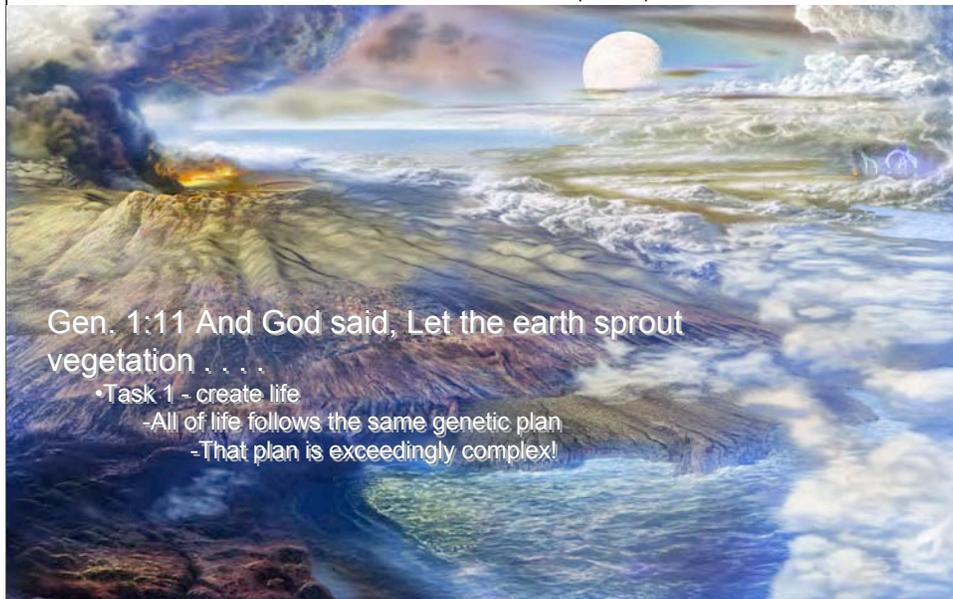
God created a special molecule called "nitrogenase" which does the nitrogen

Genesis 1:11-13, Day Three, Part 2: The Creation of Life



One of the

Genesis 1:11-13, Day Three, Part 2: The Creation of Life



Gen. 1:11 And God said, Let the earth sprout
vegetation

- Task 1 - create life
- All of life follows the same genetic plan
- That plan is exceedingly complex!

One of the most amazing facts in biology is that every kind of life uses the same genetic plan

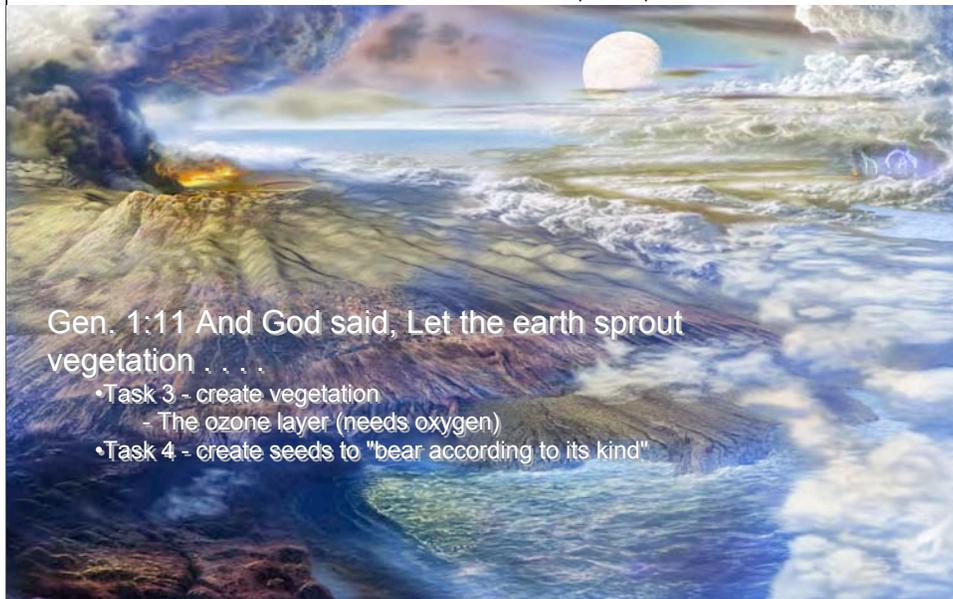
- all of the instructions needed to build that kind of life are contained in the genetic code (DNA or RNA) which is built up using combinations

of only four basic molecules called nucleotides. The coding scheme is the same for all of life.

- all of the genetic code is copied and then converted to proteins in the same way. This is called the "central dogma" of genetics. It is very

complex and it is the same

Genesis 1:11-13, Day Three, Part 2: The Creation of Life



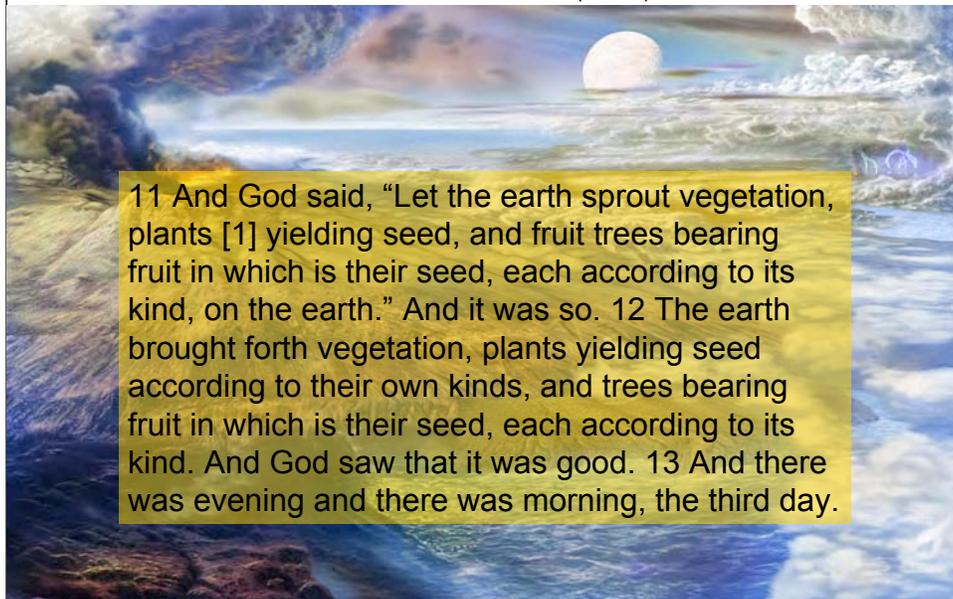
After there was a sufficient amount of organic food available, God then created land vegetation.

Another irony occurs at this point. Oxygen, which was a waste product to the early bacterial life, is now essential -- not because the plants

directly use oxygen (they use carbon dioxide and oxygen is again a waste product), but because the oxygen, converted to ozone in the

upper atmosphere is a shield against harmful radiation from space. The land plants and animals depend on this

Genesis 1:11-13, Day Three, Part 2: The Creation of Life



In summary, Day Three was preceded by the creation of bacteria, which are implicit in the Genesis narrative, but which are not specifically mentioned.

In Day Three, God prepared the earth for the future population by animals, which could feed on the plants.

It is pretty clear from the account that Moses had in mind the vegetation on the land. However there was of course a parallel preparation of the oceans as well. The oceans were also filled with food that would provide food for the animals to

Genesis 1:11-13, Day Three, Part 2:
The Creation of Life

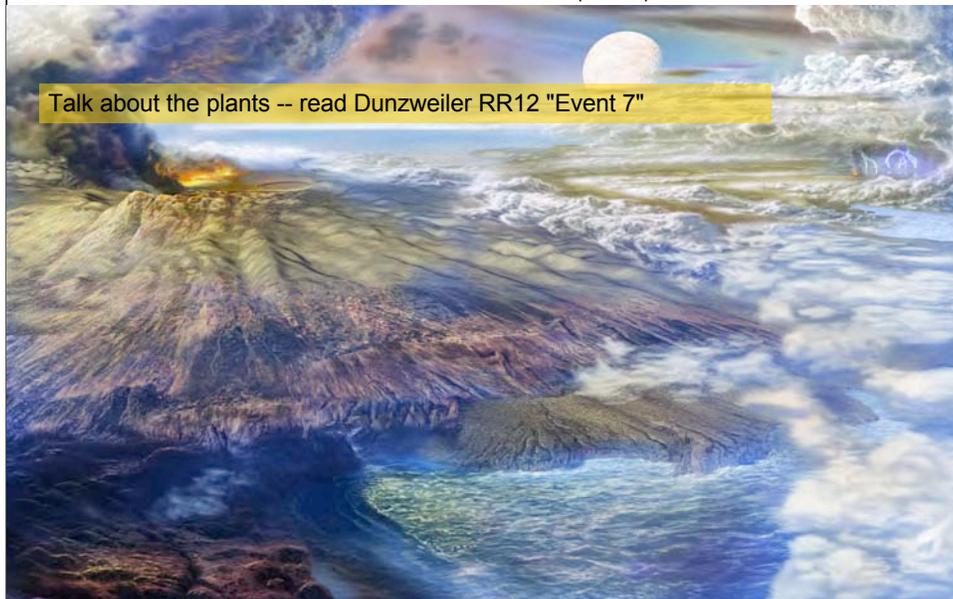


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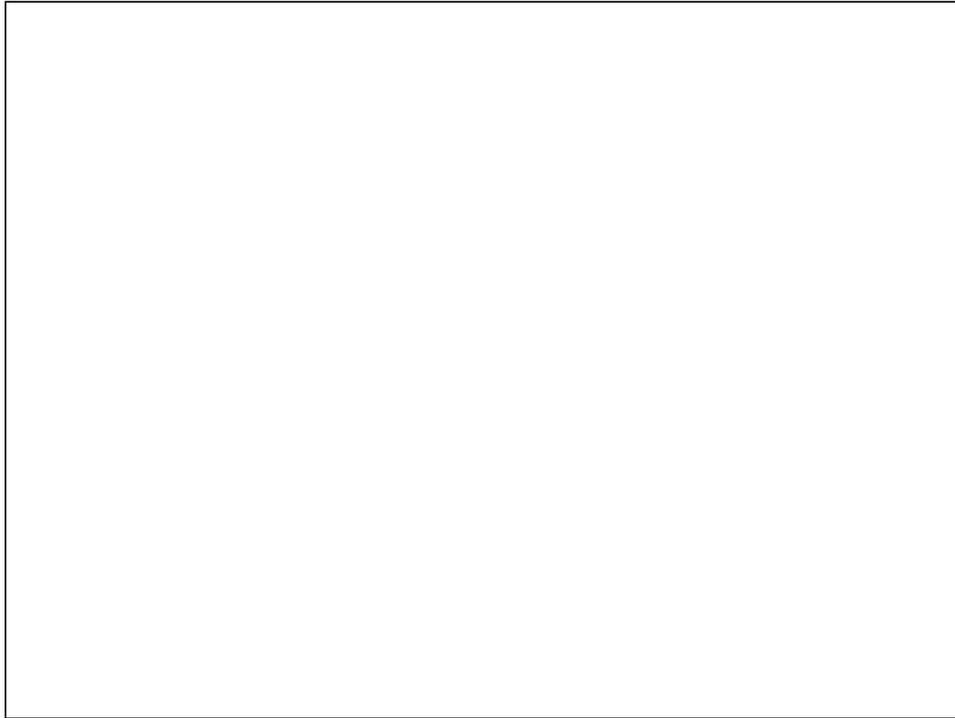
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Mention: the progression, vegetation (grasses), low shrubs, trees, fruit trees

Mention: genetic protection against change (contrast bacteria), seeds.

Genesis 1:11-13, 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, 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 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 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

St Augustine made the point that the Bible views things from the perspective of a person standing on the earth. Day four is a prime example of this.

The basic problem is that the sun was pretty clearly around since Day 1, and so these verses don't logically describe the creation of the sun, moon and stars. The view of Dr. Newman and many others is that this is the time that the atmosphere cleared up.

Genesis 1:11-13, Day Four

Days of forming	Days of filling
Day 1 light Day and night	Day 4 Sun moon stars
Day 2 land and seas	Day 5 sea animals Air animals
Day 3 vegetation	Day 6 land animals man

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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;">Day One</p> <p style="text-align: center;">God said, "Let there be daylight"</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;">Day Four</p> <p style="text-align: center;">God said, "Let there be lights in the expanse of the sky . . ."</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;">Day Two</p> <p style="text-align: center;">God said, "Let there be an expanse between the waters to separate water from water."</p> <p>God separated the waters below from the waters above to create the oceans and the sky.</p>	<p style="text-align: center;">Day Five</p> <p style="text-align: center;">God said, "Let the water teem with living creatures, and let winged creatures fly in the sky."</p> <p>And God created the creatures of the sea and the creatures of the sky.</p>
<p style="text-align: center;">Day Three</p> <p style="text-align: center;">God said, "Let the water under the sky be gathered together to let the dry land appear."</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;">God said, "Let the land produce vegetation."</p> <p>The land produced vegetation.</p>	<p style="text-align: center;">Day Six</p> <p style="text-align: center;">And God said, "Let the land produce living creatures."</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;">God said, "Let us make humans in our likeness."</p> <p>So God created humans in his likeness.</p> <p style="text-align: center; margin-top: 10px;">God said, "And to all creatures that have the breath of life in it I give every green plant for food."</p> <p>And it came to be so.</p>

