

Genesis I and Excerpts From the Luminous Web February 11, 2007

“In the beginning, when God created the heavens and the earth, the earth was a formless void and darkness covered the face of the deep, while the wind from God swept over the face of the waters. Then God said, ‘Let there be light,’ and there was light. And God saw that the light was good. And God separated the light from the darkness. God called the light day, and the darkness He called night. And there was evening, and there was morning, the first day.”

Once upon a time, say 15 billion years plus one day ago, neither time nor space had any meaning. There is not much more to say about that, except that nothing existed, save a pinpoint of probability, smaller than a proton, that was the egg of the universe, what scientists call a singularity. Then the egg exploded. Who knows why? And the universe expanded a trillion, trillion times, curving to such a degree that particles popped out of quantum nowhere. When the universe was one second old, every spoonful of stuff was denser than stone and hotter than the center of the sun.

“And God said, let there be a dome in the midst of the waters, and let it separate the waters from the waters. So God made the dome and separated the waters that were under the dome from the waters that were above the dome. And it was so. God called the dome ‘sky.’ And there was evening, and there was morning, the second day.”

As it expanded, energy cooled into what we call “matter,” beginning with particles and anti-particles. As they routinely annihilated each other in explosions of light, it looked as if they would cancel each other out. But that is not what happened. Because the fundamental processes of producing matter contain an infinitesimal asymmetry, 101 million particles of matter for every 100 million particles of anti-matter, matter won out by the narrowest of margins, and expansion continued. As the temperature dropped, hydrogen and helium formed in the few moments they could. Then the temperature dropped some more, so that heavier elements never had a chance to form.

“And God said, ‘Let the waters under the sky be gathered together in one place and let dry land appear.’ And it was so. God called the dry land ‘earth,’ and the waters that were gathered together, he called ‘seas.’ And God saw that it was good. Then God said, ‘Let the earth put forth vegetation, plants yielding seed and fruit trees of every kind on earth that bear fruit with the seed in it.’ And it was so. The earth brought forth vegetation, plants yielding seed of very kind and trees of every kind bearing fruit with seed in it. And God saw that it was good. And there was evening, and there was morning, the third day.”

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“And God said, ‘Let there be lights in the dome of the sky to separate the day from the night, and let them be signs and for seasons and for days and years and let them be lights in the dome of the sky to give light upon the earth.’ And it was so. God made two great lights. The greater light to rule the day and the lesser light to rule the night and stars. God set them in the dome of the sky to give light upon the earth, to rule over the day and over the night, and to separate the light from the darkness. And God saw that it was good. And there was evening, and there was morning, the fourth day.”

All of this occurred in the first five minutes. After that the universe settled into a half million year cooling cycle, during which little else happened. The cosmos existed as a hot cloud of ionized hydrogen and helium. Then the temperature dropped some more, and stars began to form under the influence of gravity. As they grew in mass, things heated up inside of them, turning them into nature’s own nuclear fusion reactors. Using hydrogen as fuel, they converted the lighter elements into heavier ones, such as carbon and iron.

Eventually the new stars became middle age stars and finally old stars, whose nuclear reactors broke down. Unable to defend themselves against their own gravity, the stars collapsed in on themselves, creating so much heat inside of them that they exploded in supernova. These were spectacular funerals. A supernova can release more energy in one minute than all the other stars in the sky combined. As it does, it bequeaths all its elements to the galaxy, seeding the cosmos with oxygen, carbon, hydrogen, and nitrogen.

“And God said, ‘Let the waters bring forth swarms of living creatures, and let birds fly above the earth across the dome of the sky.’ So God created the great sea monsters and every living creature that moves of every kind, with which the waters swarmed, and every winged bird of every kind. And God saw that it was good. God blessed them saying, ‘Be fruitful and multiply and fill the waters in the seas and let birds multiply on earth.’ And there was evening, and there was morning, the fifth day.

“And God said, ‘Let the earth bring forth living creatures of every kind, cattle and the creeping things and wild animals of the earth of every kind.’ And it was so. God made the wild animals of the earth of every kind and the cattle of every kind and everything that creeps upon the ground of every kind. And God saw that it was good.

“Then God said, ‘Let us make humankind in our image, according to our likeness. And let them have dominion over the fish of the sea and over the birds of the air and over the cattle and over all the wild animals on earth. And over every creeping thing that creeps upon earth.’”

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Our bodies are 65% oxygen, 18% carbon, 10% hydrogen, and 3.3% nitrogen, plus a smattering of the elements you can find listed on the bottle of your multi-mineral pills. Where did all those elements come from? From the creation of the cosmos, from the ashes of stars.

Chemically speaking, the only difference between us and trees or rocks or chickens is the way in which our elements are arranged. During World War I, when blood was in short supply, wounded soldiers were sometimes transfused with seawater, and it worked. We are all made out of the same stuff. We are all children of the universe.

“So God created humankind in His image. In the image of God, He created them, male and female, He created them. God blessed them, and God said to them, ‘Be fruitful and multiply and fill the earth and subdue it. And have dominion over the fish of the sea and over the birds of the air and over every living thing that moves upon earth.’ God said, ‘See, I have given you every plant yielding seed that is upon the face of all the earth, and every tree with seed in its fruit. You shall have them for food. And to every beast on earth and to every bird of the air and to everything that creeps on earth, everything that has the breath of life, I have given every green plant for food.’ And it was so.”

After the universe had been cooking along for ten billion years or so, our solar system congealed out of a nebular cloud. Earth did not start out blue and green as we know it now. For those colors it needed life, and for life it needed water and organized molecules. Both of which were delivered to earth by comets.

The oldest rocks on the surface of the earth date back some 3.8 billion years. A few of those rocks off the coast of Australia contain fossils of blue/green algae that are 3.5 billion years old. The leap from those rocks to that algae is what no one, so far as I know, can explain. What we do know is that the sun was exactly the right distance away for photosynthesis to occur. And that because it did occur, the oxygen in the atmosphere was maintained at 20.9%, so that further life forms could emerge. In the classical scheme, marine and vertebrates were next. Then more sophisticated plants. Then fish with bones. Then amphibians, then reptiles, then mammals, then birds, then primates, then us.

“God saw everything that He had made and, indeed, it was very good. And there was evening, and there was morning, the sixth day.”