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# THE UNIVERSE STORY

A version by

[Patricia Gordon](#)

The first two divisions of this version, the First Wonder and the Second Wonder, are largely based upon adapted and quoted material, particularly from Brian Swimme, updated and with original material woven in. See Notes.

## THE FIRST WONDER

13 billion years ago

**The Radiance:** In a fiery unfurling, space, time, light, and subatomic particles billow forth from potentiality, the originating reality, the ultimate mystery. When the Universe is one-trillion-trillion-trillionth of a second old, its primal fire is a fire that is a billion trillion times hotter than the center of the sun. It is a fire that is a trillion trillion trillion times denser than rock. From a region perhaps smaller than a single atom, flares an explosion so colossal that it continues, even after thirteen billion years, to overpower the combined gravitational force of the entire Universe.

**The Shimmering:** Particles and antiparticles cascade into existence, interact, and disappear into an explosion of light. They again cascade into existence, interact, disappear, cascade into existence, interact, disappear. . . . Electrons, positrons, quarks, neutrinos interact freely, vibrating patterns of energy in a vast tide of light. There are no laws. Then **The Laws** emerge, the laws of interaction: gravitational, electromagnetic, weak nuclear, strong nuclear. The shimmering continues.

One-millionth of a second has passed.

**The Great Annihilation:** The Universe has expanded and cooled to the point that when particles encounter

antiparticles and disappear, no new particles appear. The number of particles drops steadily to only one 200-millionth of the original matter of the Universe. The Universe is saved from extinction by its slight bias of 101 million particles for every 100 million antiparticles. By the end of the first second the annihilation ceases. Free-floating quarks join together to form neutrons and protons.

The Universe continues to expand and cool. Three minutes pass.

**The First Foundation:** The surviving particles can now enter into enduring relationships: simple nuclei and heavy subatomic particles. All future ground, whether stars or planets will find its strength from this, the world's first foundation.

Three hundred thousand years pass.

**The Stunning Transformation:** In an instant, everywhere, the Universe transforms itself into atoms of hydrogen and helium. The creation of atoms is as stunning as the creation of the Universe. Nothing had hinted at their emergence. These dynamic twists of being leap out of the originating mystery and immediately organize the Universe in a fresh way.

**The Transparency:** The vast space within hydrogen and helium atoms allows photons to shoot through them without ever meeting an obstacle. Photons fly quickly and silently through these new clouds of beings. The Universe becomes utterly transparent, invisible.

**The Lacy Veils:** Quantum fluctuations are magnified into immense fluctuations in the vast, transparent cloud of hydrogen and helium, and the invisible cloud breaks up into billions of separate galactic clouds.

Hundreds of millions of years pass.

**The Spirals of Fire:** In these separate invisible clouds, ripples created by gravitational interactions eventually shock the clouds into condensing rapidly into thousands of stars at a time, the primal stars, igniting. If the gravitational force had been a trillionth of a trillionth of a trillionth of one percent stronger or weaker, it would have either crushed the whole Universe into a black hole within a million years, or the Universe would have flown apart too rapidly for any galaxies or stars to form.

**The Second Annihilation:** In this birth of galaxies, the

density of the Universe erupts into galactic collisions. Some galaxies are blasted into shreds of gas; some are scattered into abandoned stars; some, in near-collision, are wrenched by gravitational tidal waves which disturb their condition for the next 13 billion years. Some of the spiral galaxies that do escape with their form intact have their interstellar gases sucked away by other worlds passing through. Most of the galaxies that do survive the beginning storms are in regions so dense that their fertile spiral structures are destroyed, leaving them in the shape of elliptical galaxies no longer capable of creating stars.

**The Gifts of Fire:** In the unbearable pressures of primal stars, the elements are formed for the first time: carbon, oxygen, nitrogen, copper, silver, silicon, magnesium, calcium, sulphur, iron . . . . all the elements in existence now. As the stars age and eventually supernova, these elements are exploded out into the galaxy forming vast clouds, breaking into subclouds. Any part of the primordial fire destined to become enveloped in the unfolding of life or consciousness must first pass through a supernova explosion, its brilliance an intensity matching a billion stars.

## **FROM OUR DEEP HOME TO OUR FAMILY HOME**

Most of the atoms of our Sun, Earth, and bodies are a gift from the supernova of our local primal star.

4.6 billion years ago.

**The Sustaining Presence:** Gravitational ripples in the clouds left by our Ancestral Star's supernova trigger the simultaneous birth of thousands of second-generation stars, one of which is our Sun. The Sun will hold Earth, enveloping it with warmth and light, sustaining it with its presence.

**The Creative Planet:** The disc of gases surrounding the Sun is rich with the elements from our Ancestral Star. These elements collide, and centers of concentration develop that violently sweep even more of the matter into themselves. Through fiery impacts of increasingly massive collisions, the spherical planets emerge.

Radioactive energy in their core keeps the planets in a boil. Great currents of energy bring materials from deep inside the planets to the surface. In Mercury, Venus, Mars and Pluto this boiling finally is choked off by thick crusts. These small planets can't generate enough pressure to

break rocks already formed. The crust chokes off the dynamism of the interior heat of radioactivity. In giants Jupiter, Saturn, Uranus, and Neptune the boil persists. There is so much gravitational strength that no crust or rocks form. Only Earth is the proper size enabling balance between stability and dynamism.

And only Earth is balanced in its relation to the Sun, not too far and not too close. Its temperature range will allow the complex molecules of life to eventually form.

Only dynamically balanced, temperate Earth has further creative potential.

## **THE SECOND WONDER**

Sometime between 3.9-3.5 billion years ago

**The Double Star-Spirals:** The Creative Planet orbits a young Sun, dimmer than now. It is a reddish-brown, largely molten, still radioactive planet cooling its crust like skin on a steamy pudding. Its thickening skin heaves, cracks, and slides about, pouring forth ever more of its fiery molten rock, pushing up mountains, and buckling in valleys, only to rearrange them again and again. Meteors continually strike the changing landscape, splatting down to form craters of all sizes.

Magma cools into rock while its gases and steam form a murky, brownish-orange atmosphere of carbon dioxide, hydrogen sulfide, steam, and methane. As the steam collects in vast quantities, the great rains begin, hissing to Earth and helping it cool. Continuous giant electrical storms, immense lightning bolts, continuously sweep the planet for millions of years. Eventually, rivers form and pour themselves into growing seas. Erosion begins as cooled rock breaks up or is sloughed off by the rains, washing down rivers and into the seas, filling them with salts and other minerals.

When the stardust of this turbulent planet transforms itself into the living double spirals of DNA, the exquisite star spirals of life, has the planet cooled to an icy surface pocked with volcanoes? Is the planet temperate? Still fiery hot? Does the Second Wonder emerge in pools? In deep sea vents? Clay? The mystery remains. Somewhere, somehow one, or a family, or several radically different branches of families are called forth that have the power, or "memory," to reproduce the very sequence of activities

that had called them forth. By themselves they can repeat the amazing act of creating life. One of these, the cell that survives, is our First Ancestor. From First Ancestor all other creatures will flow, in their three great Domains: the Extremists, the lovers of the very hot and very salty; the Alchemists, the amazing, transformative bacteria; and the complex Envelopers, who first envelop the double star-spirals into a nucleus; then envelop various Alchemists; and, later, each other.

**The Sun-Catcher:** the early cells in the three Domains feed on the exotic, energy-rich chemistry created by the turbulence of hot, early Earth. Their diet is one of diverse chemical creations. But then Earth's turbulence slows down, and so does the production of such compounds. There is a grave danger that some essential and scarce chemicals will be eaten up, leaving few remaining non-Extremist cells.

A surprising invention by one of the Alchemists sidesteps disaster. A molecular net with the power to capture photons in flight emerges through mutation. The energy of a particle rifling through the air at the speed of light is, along with other substances, converted into food. This is one of the greatest acts of creativity in life's four billion years on our Creative Planet: the Sun Catcher, who feeds on the Sun.

**The Oxygen Catastrophe:** The Sun Catchers, the blue-green photosynthetic Alchemists, cleave hydrogen from water molecules and send oxygen into the networks of the planet.

The powers of oxygen are among the most formidable of all the elements. Oxygen is in perpetual need of electrons and will rip them out of previously stable compounds. As oxygen is released into Earth's cycles, it invades the rocks. The iron minerals rust, and Earth's land turns red. Once the land has been transfigured, oxygen grows in strength in the atmosphere and disrupts its ammonia, its carbon monoxide, and its ancient and previously irreplaceable hydrogen sulfide. The atmosphere slowly turns blue, as does Earth's water. As oxygen's work in altering the nature of Earth's water and air nears completion, it hovers over the land and leaps upon any new upwelling of molten rocks from the interior, quickly changing their chemistry as well.

Once oxygen's radical transformation of the land, water, and atmosphere has been carried out, life's sphere can no longer avoid facing this profound disruption. At first, cells had been able to ignore oxygen, since its

concentration was so low. But eventually every arena has been invaded by oxygen and the very source of this oxygen—the Alchemist Sun Catchers--have to deal with its presence, along with the innocent Envelopers.

Oxygen begins by gradually eliminating the food supply. Carbohydrates rich in energy, desired by all Alchemists and Envelopers, are rendered chemically useless as oxygen breaks down the richest molecules. Oxygen penetrates into the food the instant it is created and makes it inedible, changing it into particles of dust. Oxygen also deals directly with the cells. The fragile membranes are attacked by the oxygen until the cellular cytoplasm breaks free, leaving the tiny creature to expire into dispersing droplets of its own parts.

Oxygen also slides through cellular membranes and takes apart the enzymes, leaving the cell helpless to perform its life-sustaining tasks. Oxygen enters and changes fat molecules into slowly burning flames. In groups of ten trillion, oxygen attacks the cell's DNA nerve center, consuming electrons and tearing apart structures. Where there had been a vibrant living cell, there remains only a disconnected and chemically meaningless scrap, all that subtle and elegant information evaporating as if it had been inscribed on a papyrus roll now in flames.

Where once there had been vast multilevel collectives of beings, there are left scattered remnants still under a relentless attack from a lifeless enemy. The first great eon of life's history ends in catastrophe.

**The Breath of Fire:** Ever creative, life mutates. An Alchemist appears that invents respiration, or controlled combustion, the power to deal with oxygen. This breath of fire gives it vastly more energy than any other type of cell. That which had been killing life now enables it to burst with vitality. The Alchemist Breath of Fire flourishes, and Earth's system stabilizes itself near 21% oxygen, just below the level of spontaneous combustion, where the combustion of respiration is still manageable.

**From Aloneness to Bonding:** Hungry Envelopers' engulfment of Alchemist Breaths of Fire transforms over time into a deep cooperative bond. The Enveloper shares food molecules with Breath of Fire. In turn, the Enveloper can now survive in the increasingly oxygen-saturated environment. The oxygen, instead of setting the cell's insides to a slow flame, is quickly swallowed by Breath of Fire, inside the edge of the Enveloper's membrane. Also, with the intense energy production of the Breath of Fire,

the Enveloper can now enjoy powers it could never have generated by itself.

As time goes on, even the subtle and delicate process of creating new versions of themselves eventually proceed as a single act. Their rhythms of life enmesh with each other, although the Breath of Fire remains partly under the control of its own DNA. Breath of Fire in time evolves into the partly independent mitochondrion, the center of energy production that will be found in all animal Enveloper cells for the billions of years to come.

This deep cooperative bond, along with a similar one for plants, is the single greatest transformation of life in the entire history of Earth, only overshadowed in significance by the emergence of life itself. From this time on, all major transfigurations of the life world will use this same new cell form, this same system of intimate relationship of Enveloper and Alchemist.

**The Deepening Intimacy:** The creativity of these Envelopers sparks new forms. Predator Envelopers begin to specialize in certain forms of prey. The prey in turn coevolves to adapt to this fight for its life. The haphazard, random encounters of previous cells become ecological, systemic, and patterned, the predator and prey closely matched.

Within this intimacy of ecosystems, the intimacy of sex evolves. It begins in cannibalism. During hard times, when faced with starvation, predator Envelopers engulf their own kind. The resulting two-nuclei Enveloper has access to a larger body of fruitful information than a one-nucleus cell. From this two-nucleus situation, sexual Enveloper cells eventually evolve, which create two special cells, each one having only one set of chromosomes.

When one of these special reproductive cells encounters a different reproductive cell, something new awakens. Something unsuspected and powerful and intelligent, as if they have drunk a magical elixir, enters the flow of electricity through each one. Suddenly the very chemistry of their cell membranes begins to change. Interactions evoked by newly functioning segments of DNA restructures the molecular web of one cell's membrane, so that the other cell can enter wholly.

This act that they enter upon so rashly leads to both of their deaths, or, rather, to their rebirth in a new form. The cell's tumultuous entrance is followed by the

dissolution of its cell membrane, and its absorption into the other's cytoplasm. Both genetic strands stretch themselves out, with each laying itself snugly into the contours of its partner. A complete cell is reborn. Out of this new combination, novelties can arise in a single generation that would otherwise require many thousands of Enveloper cell generations to develop.

**The Union:** It begins as a loose association of sexual Enveloper cells. Those activities that each genetically different cell excels at are drawn upon by the other Envelopers more often than its other activities. After millions of years, a critical threshold is passed: one day a unified organism emerges in the sea. The first multicellular animal, or animals, are as much a surprise as the emergence of the hydrogen and helium atoms, as much a surprise as the emergence of galaxies. There follows an exuberant explosion of creative forms, among them the worms, who invent the nervous system.

Sometime between 540-500 million years ago

**The First Ice Death:** The Creative Planet is engulfed in extensive glaciation. The seas cool; the shallow seas withdraw from continental shelves. A spasm of extinction overcomes the Planet's inhabitants. Gone are most of the journeyers from aloneness to bonding, gone are most of the creators of intimacy and union.

**The Gifts of Form:** All future forms of animals are music played on the themes that survived the Ice Death. These remaining body plans are all Earth will ever see. All future animals will employ variations on the same forms that survive at this time.

440 million years ago

**The Second Ice Death:** Earth suffers the second most devastating extinction of marine communities in its history, and the second Perishing by ice.

**Exuberance in the Sea:** Jawed fishes, descendants of early fishes, which developed out of the family of worms, emerge. Later, ray-finned fish glide and swoop through the seas. Their gift to us: our symmetrical, limbed form.

**The Heroic Journey to Land:** The first heroes to venture onto land are plants. The animals dare not. Given the nature of the continents at this time, to have eyes is to eliminate any courage. Above the water, one faces a red, lifeless expanse of baked rocks and rubble and dust, barren as a moonscape. There is no living soil. There is

nothing green. And on land life faces an invisible enemy, a reality so pervasive and so strange and so overpowering that life remains exclusively in the oceans for ninety percent of Earth's history. This invisible power comes to be called, hundreds of millions of years later, gravity. Yet the genius of creativity swells within those plants, and they are the first to invade an alien world and the first to stand up to gravity.

The first animals to follow, millipedes and springtails, meet the challenge of land by developing an stiff outer covering that can keep water within. They and their predators which follow them, spiders, centipedes, and mites, become, in a sense, mobile living ponds.

The insects are followed, millions of years later, by an air-breathing fish, whose stumpy fins are good for hunting shallow-water prey--and, in the future, for walking. Its descendants, attracted periodically to distant protected ponds to raise offspring, become the first amphibians. This fish's revolutionary advance into breathing air is painfully provoked over millions of years by repeated and prolonged periods of near suffocation. The revolution begins with a strangled gasping for air, and ends with a stunning penetration of a forbidden element.

The water is a place of reek and corruption, of fetid smells and of oxygen-starved fish breathing through laboring gills. On its oily surface, from time to time a snout thrusts upward, takes in air with a queer grunting inspiration, and swirls back into the corruption. The water is foul, and its oxygen almost gone, but the creature will not die, for it can breathe air direct through little accessory lungs. Though its snout is grotesque, the face should not be mocked. In four hundred million years it will be our own.

370 million years ago

**The Third Ice Death:** Once more the ice descends. On land and especially in the sea, life drastically dwindles. Almost gone are the creative Reef-Builders.

250 million years ago.

**The Great Dying:** A massive extermination sweeps land and seas, the most devastating extinction in the four billion years of life's adventure. Everything that can go wrong does: a possible meteor impact; drops in sea level; the largest volcanic eruption in the history of the Earth in Siberia, lasting at full intensity for a million years; and a later rise in sea level. Climate fluctuations,

loss of habitat, acid rain, wildfires, release of poisonous trace elements, increases in ultraviolet radiation, volcanically-induced glaciation, oxygen-depleted waters, an enormous degassing of an ocean supersaturated in carbon dioxide, and prolonged global warming take their deadly toll. 90% of all species in the oceans vanish; 78% of reptile families and 67% of amphibian families perish; 30% of insect orders cease to exist, the only known mass extinction of insects; land plants are decimated. 80% of the total of all global species go extinct. The Great Dying has the greatest effect on the history of life in the sea of any event since the appearance of multicellular animals.

210 million years ago.

**Death from the Sky:** Death streaks down from the sky. One or more asteroids smash the Earth, one leaving a 100-kilometer crater at Manicouagan in Quebec, and oceanic changes deplete oxygen in shallow waters. Many sea dwellers and therapsids, warm-blooded reptiles, perish.

**The Warm:** The therapsids were the inventors of the power to maintain a warm body even in the face of a cold outer world. As another kind of warm, dinosaurs invent parental care in the reptile world. They stay with their young after they hatch from their eggs, nurturing, but not nursing, them until their independence.

**The Sky Dancers:** A direct descendent of the dinosaurs, the first bird appears, later evolving into many kinds of birds, a bounty of beautiful sky dancers.

**The Beautiful:** Somewhere, just a short time before the close of the Age of Reptiles, there occurs a soundless, violent explosion. It lasts millions of years, but it is an explosion, nevertheless. It marks the emergence of the flowering plants. Before this time, wherever one might have looked, from the poles to the equator, one would have seen only the cold dark monotonous green of a world whose plant life possessed no other color. Flowers change the face of the planet. Without them, the world we know--even humans--would never have existed.

The agile brain of the warm-blooded birds and mammals demands a high oxygen consumption and food in concentrated forms, or the creatures cannot long sustain themselves. It is the rise of the flowering plants that provides that energy and changes the nature of the living world.

Before the coming the flowering plants our own ancestors, the warm-blooded mammals, consist of a few mousy little creatures hidden in trees and underbrush. A few lizard-like birds with carnivorous teeth flap awkwardly on ill-aimed flights among archaic shrubbery. None of these insignificant creatures gives evidence of any remarkable talents. The mammals in particular have been around for some millions of years, but have remained well lost in the shadow of the mighty reptiles. Truth to tell, humankind is still, like the genie in the bottle, encased in the body of a creature about the size of a rat.

Neither the birds nor the mammals, however, are quite what they seem. They are waiting for the Age of Flowers.

The old, monotonously green world changes into something that glows here and there with strange colors, puts out queer, unheard-of fruits and little intricately carved seed cases, and, most important of all, produces concentrated foods in way that the land has never seen before.

The flowers bloom and bloom in ever larger and more spectacular varieties. Some are pale unearthly night flowers intended to lure moths in the evening twilight, some among the orchids even take the shape of female spiders in order to attract wandering males, some flame redly in the light of noon or twinkle modestly in the meadow grasses. Intricate mechanisms splash pollen on the breasts of hummingbirds, or stamp it on the bellies of black, grumbling bees droning assiduously from blossom to blossom. Honey runs, insects multiply, insects that are really converted nectar.

Without the gift of flowers and the infinite diversity of their fruits, humans and birds, if they had continued to exist at all, would be today unrecognizable. Lizard birds might still be snapping at beetles on a sequoia limb; humans might still be nocturnal insectivores gnawing roaches in the dark. The weight of a petal has changed the face of the world.

65 million years ago.

**The Fire Death:** An asteroid flames through the atmosphere, striking the Yucatan Peninsula of Mexico with the energy of 100 million megatons. It leaves Chicxulub Crater, 180 kilometers across, and a devastated North American continent. Close to the same time, gigantic volcanic eruptions are flaming forth in

western India. Dust, smoke and debris encircle the Earth. Prolonged darkness, cold, and acid rain torture Earth's surface. A long period of severe fluctuations in climate and ocean temperature adds to the agony. The devastating Fire Death is the fifth mass extinction of the Creative Planet. Among the many who perish are the dinosaurs.

**The Dazzling Abundance:** Descendants of the tiny mammals appearing in the age of the dinosaurs explode into a richness of species, with their gifts of fur, live birth, and nursing.

The astonishing abundance of species on the Creative Planet, both mammals and other life community members, surpasses that of any previous era. There is never a time in the four and a half billion years of the Creative Planet's existence with as many species of life as there are at this time. Perhaps the only word to describe the diverse, dazzling world that gave birth to the human form of life is--paradise.

## **THE THIRD WONDER**

2.4 million years ago.

**The Gifts of Imagination:** Humans with their free-ranging, creative consciousness appear. In humans' long unfolding on the Creative Planet, gifts have streamed forth from the mystery of their imagination. With their ability to hold the Earth and the Universe in their vast, symbol-weaving minds, they have celebrated the Planet and the unfolding mystery of the Universe through stories, art, poetry, religion, mathematics, and science. With their awareness of suffering and death in all places, present, past, and future, they have carried the burden of terror and grief for the Planet, affirming the preciousness of each lost presence by their sorrow. In spite of their consciousness of this dark, they have chosen to hold the Earth and the Universe in their vast hearts and envelop them with their acceptance and love. They have intimately communed with the other presences on Earth through deeply imagining these other beings' inner experience. And their wide-ranging awareness may lead them to serve as protectors of the Planet from another Fire Death from the Sky. Celebrators, Symbol Weavers, Sorrowers, Lovers, Empathizers, and Protectors, humans are Pioneers in Imagination.

**The Death from Within:** Only a few Pioneers strongly develop some powers and expansions of the imagination in scattered places and times. The Pioneers are not completely The Earth's Imagination. They have not yet blossomed into complete humans.

As the first Pioneers, tribal peoples, spread over the Creative Planet into unknown communities of life, their limited awareness of their new home leads them to unintentionally extinguish other kinds of beings. They eliminate forever part of their Earth Family. Gone are many of their Only Companions, the only living presences accompanying them in the Creative Planet's journey, unfolding through the vast deeps of time and space. The first Pioneers then learn to live with their remaining Family and Companions. Matching the dazzling diversity of their home regions, these Pioneer Learners create brilliantly diverse, successful arts of community living.

The Creative Planet's inventiveness continues, and new ways of living emerge. But the Pioneers in these different situations do not learn new ways of living in community with the Family. Eventually, in continuous waves over the Earth, they spread and exterminate until another massive planetary extinction is underway, including the extinction of the Learners. The whole Creative Planet is covered with the Death from Within, the Family killers becoming more and more alone in space and time.

**The Luminous Vision:** In the midst of this planetary ordeal, the creativity of the Universe comes welling up once again, as it has so many times during catastrophes in the past, to transform the Earth's agony into a deepened beauty. Death from Within pulls back from being the bringer of a great Dying, pulls back from being the peer of a massive ice age, killer asteroid, or million-year volcanic eruption. Inspired by a more luminous vision of their destiny as a species, humans become passionately involved in blooming into the fullness of their humanity. They emerge into beneficent Adventurers in Imagination, Heroic Rescuers, Vast Minds and Hearts, Stunning Beauty, Planetary Lovers, and Incredible Inventors of Gifts. Given confidence by the pioneering success of the tribal, regional Learners, they become urban, planetary Learners, also honoring the regional knowledge of the tribal pathfinders. They develop into Humble Restorers, the Planet's Sorrowers, and All-Embracing Empathizers. They and other remaining Family members flourish and evolve, with surprising emergences of further Wonders, amazing developments, delights, companionship, tough challenges, and high drama.

Around 500 million years in the future

**The Final Perishing:** Entering into the beginning of its death phase, its journey to becoming a red giant and then a white dwarf, the Sun, the Earth's Sustaining Presence for so long, becomes a Deadly Presence when its heat grows steadily. Around 500 million years Earth becomes too hot to sustain human life. In this Final Perishing, The Creative Planet becomes totally barren and baked by one billion years, only Extremists surviving in the deep crust.

Within three billion years, the Milky Way Galaxy and the Andromeda Galaxy, two times the size of the Milky Way, collide. Are the Sun and its cinder planets cast into intergalactic space? Are they flung into the new galactic core, deadly with just-ignited stars and bombardments? Will the Family members know at some future time because, before the Final Perishing, they succeeded in soaring in some form from their beloved Earth Home into their Deep Home? Adventuring, ever-evolving, do they continue to be a gift to the Universe's unfolding?

With or without the Family

**The Journey Continues:**

From wonder to wonder, existence opens.

## NOTES

The First and Second Wonder divisions consist largely of quotations and adapted material, most of it from the relevant chapters in Brian Swimme and Thomas Berry's *The Universe Story* and from Swimme's "Cosmic Prologue" in *Liebes*, with original wording, sentences and sections, including all the extinction sections, woven in. Some adapted material is heavily transformed; some is less so.

Updating of *The Universe Story* material was based on information from the sources in the Bibliography, especially Cowen. It may be of interest to know that he has a website which includes updates of the topics covered in his comprehensive text on the history of life: GOTOBUTTON BM\_1\_ [http://www-geology.ucdavis.edu/~GEL3/\(The](http://www-geology.ucdavis.edu/~GEL3/(The) hyphen after the www is correct.)

Headings and capitalized names of creatures are original,

as is the material echoing the heading in the text, with the exception of the text echoes in *The Shimmering*, *The First Foundation*, *The Stunning Transformation*, *The Transparency*, *The Oxygen Catastrophe*, and *The Heroic Journey to Land*. The use of the phrase "The Radiance" to refer to the Big Bang is from children's author Philemon Sturges. "The Great Dying" is a phrase used by scientists.

The last sentence of *The Radiance* is adapted from Rue, 51, 56. The last sentence of *The Great Annihilation* is taken from Rue, 57.

The first two paragraphs of the *Double Star-Spirals* are adapted from Elisabet Sahtouris, "New Ways of Looking at Life," in *Liebes*, p. 40. The third paragraph is mostly original text with two sentences from Swimme sandwiched in the middle.

The last paragraph of *The Heroic Journey to Land* and the entire section of *The Beautiful* are adapted from Eiseley's "The Snout" and "How Flowers Changed the World."

The *Third Wonder* section is all original text, except for the phrase "Earth's Imagination," in the *Death from Within* section, which is taken from Brian Swimme's *Earth's Imagination* video series. The *Third Wonder* section's general emphasis on the imagination is inspired by that series and *Canticle 8* of Swimme's *Canticle to the Cosmos* series. It is worth noting that in the *Final Perishing*, the Sun's heat and the galaxy collision section is factual. See Hayden and Irion. The *Extremist survival* is a speculation.

The last sentence of the *Third Wonder* is quoted from the *Tao Te Ching* (Bynner, 31).

The omission of dates except for the beginning of each *Wonder* section and the move into our *Local Home* is deliberate in order to keep the focus on the flow of the emergences. Dates are given for *The Third Ice Death* through *The Death in the Sky* so that it is clear that they are separated by long time periods and don't run into each other. Other extinction dates are given for consistency. Dates for the very beginning of the Universe and the end of the Earth are given for essential orientation.

I originally created this text for the use of my literature students, as a coherent, explanatory background for some of the related literary texts we were reading. Later, I came to realize that it could be of interest to a broader audience. I hope readers find it helpful for their purposes.

I consider the text to be a perpetual draft in process and will be continually improving both its scientific and poetic aspects, in addition to smoothing out its style and tone. I welcome corrections and suggestions for improvement. Any corrections or suggestions incorporated into the text will be duly acknowledged.

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Last updated: June 11, 2001.

## **BIBLIOGRAPHY**

American Association for the Advancement of Science. "New Clues About the 'Great Dying' Traced in Science." *MSNBC* 20 July 2000  
<http://www.msnbc.com/news/432102.asp>

Bynner, Witter, trans. *The Way of Life According to Lao Tzu: An American Version*. New York: Perigee, 1986.

Cowen, Richard. *History of Life*. 3<sup>rd</sup> ed. Malden, Massachusetts: Blackwell, 2000.

De Duve, Christian. "The Birth of Complex Cells." *Scientific American* (April 1996): 50-57.

Eiseley, Loren. *The Immense Journey*. New York: Vintage, 1957.

Erwin, Douglas H. "The Mother of Mass Extinctions." *Scientific American* (July 1996): 72-78.

EXN staff. "Collision May Have Caused Great Dying." *EXN: Discovery Channel Canada* 22 February 2001  
<http://www.exn.ca/stories/2001/02/22/52.asp>

Goodenough, Ursula. *The Sacred Depths of Nature*, New York: Oxford, 1998.

Hayden, Thomas. "Curtain Call." *Astronomy* (January 2000): 45-49.

Irion, Robert. "A Crushing End for Our Galaxy." *Science* 287 (7 January 2000): 62-64.

Liebes, Sidney, Elisabet Sahtouris, and Brian

Swimme. *A Walk Through Time: From Stardust to Us*. New York: John Wiley and Sons, 1998.

"Mass Extinctions." Hooper Virtual Paleontological Museum. Ottawa-Carleton Geoscience Center.  
<http://www.wf.carleton.ca/Museum/6.html>

Rue, Loyal. *Everybody's Story*. New York: SUNY, 2000.  
Swimme, Brian and Thomas Berry. *The Universe Story*.  
New York: HarperSanFrancisco, 1992.

The Domains of Life I and II. CD-ROM. Beaufort,  
South Carolina: BioMEDIA ASSOCIATES, 1999.

Ward, Peter D. and Donald Brownlee. *Rare Earth: Why Complex Life is Uncommon in the Universe*.  
New York: Springer-Verlag, 2000.

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