The Way of Science and the Epic of Evolution

by Connie Barlow

Schools, churches, and the media are all beginning to sound the same message: that it is our duty to live lightly on the land, to refashion our lives in at least modest ways to make amends for the environmental woes we are causing. It can be quite depressing. We begin to think of our own species as uniquely malign. Only through self-abnegation and saintly acts can we halt the destruction. The best we can hope for is to do less harm. And we do less harm by way of duty.

Duty is that which we do because we should—not because we would. In contrast, an action that is as natural as drawing breath is not a duty. In Immanuel Kant's terminology, a difficult-appearing act undertaken without any thought of duty, perhaps even joyfully, is a beautiful act. A beautiful act, unlike a dutiful one, arises from our deepest inclinations. We simply could not do otherwise.

Arne Naess, the Norwegian philosopher who gave the "deep ecology" worldview its earliest expression, believes Kant's distinction is crucial for the earth's well-being. "When people feel they unselfishly give up or sacrifice their self-interests to show love for nature," warns Naess, "this is a treacherous basis for conservation." Doing right by the earth should, rather, feel as natural as doing right by our families, our very selves. According to Naess, the way to nurture this mind-set is to expand our notion of self to include Self—the greater self of the planet, with all its creatures and landscapes.

The ecological crisis thus demands a deep solution. The will to change must come from within. Only a shift in values can work a lasting shift in laws and institutions and, most important, everyday practices. And those values must emerge from a shift in worldview that is in a fundamental sense religious.

Not long ago it was intellectually fashionable to declare that religion's time had passed. Religious experience—and even more so, religious dogma and institutions—were regarded as drags on human progress. Supernatural belief bound the believer to prerational states of consciousness and choked societies with premodern doctrines. Marxists assailed skyward-looking religions for lulling the downtrodden into accepting a wretched existence here on earth. Nietzsche proclaimed, "God is dead."

But smug disregard of the religious impulse has recently fallen out of fashion. Many people now realize that a sense of the sacred need not be based on superstition and supernaturalism. Theologians like James Gustafson put forth definitions of religion that are as accessible to atheists as to theists and that, more-

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The Lagoon nebula (Messier 8) in Sagittarius. © Anglo-Australian Observatory/Royal Observatory Edinburgh. Photograph made from UK Schmidt plates by David Malin.

over, offer possibilities for making peace with the earth. In Gustafson's view, the religious capacity manifests itself as "a sense of dependence, of gratitude, obligation, remorse or repentance, and of possibility." Philosopher Loyal Rue defines religion simply as "an integrated understanding of how things are (cosmology) and what things matter (morality)." The human religious capacity is also being taken seriously today because of the work of biologists with impeccable credentials as scientific materialists. These scientists made the astonishing discovery that the religious impulse (for good or ill) may be too deeply rooted to be rooted out.

A Surprise from Sociobiology

In 1978 Harvard biologist Edward O. Wilson, founder of sociobiology, a new branch of science that explores the evolutionary roots of social behavior in animals, left prairie dogs and chimpanzees behind to focus on the human species. In so doing, he widened his scope to include philosophy and religion. The resultant book, *On Human Nature*, was not a work of science, Wilson cautioned. It was more a "speculative essay"—one that earned its author a Pulitzer Prize. Nevertheless, the science and argumentation Wilson presents on the sociobiology of religion are formidable.

The predisposition to religious faith is "the most complex and powerful force in the human mind," Wilson conjectured. It is likely "an ineradicable part of human nature." Wilson includes in his list of innate religious qualities the "mythopoeic drive," along with such unsavory items as xenophobia, trophyism, and attraction to charismatic leaders. Those who view religion in a more congenial light might build a list around such things as a sense of wonder, an urge to express gratitude, a capacity for mystical experience, a reverence for whatever is deemed sacred, and a drive to find ultimate meaning in life, suffering, and death.

Yet, however one chooses to characterize the human religious capacity, the "collision between scientific materialism and immovable religious faith" noted by Wilson is inevitable. Fanaticism thrives on both sides of the divide. And the casualties—those whose spirits are vacant, or fulfilled mostly in shopping malls—greet us on buses, in the workplace, in our houses, inside our own skulls.

What to do?

Wilson makes a daring proposal. To reconcile science and religion, he writes, we must "concede that scientific materialism is itself a mythology defined in the noble sense." According to Wilson, science would remain no less real and right, but it would also be seen as ripe for extension into the realm of myth and meaning and value. Science offers humankind the grandeur of the "evolutionary epic" for putting ourselves in accord with the universe and urging us on to even greater accomplishments. Note the extension into lyricism and subjectivity implied by the word "epic." The evolutionary epic isn't science then, it is science extended into the realm of meaning. In this imaginative form, the history of life and the cosmos become the creation story for our time. My story and your story are not just part of the triumphant march of humankind. They are part of the even grander story of the evolutionary stream of life, of planet earth, and of the universe. Moreover, the grandeur of that story stands firm, even when faith in ourselves and our kind begins to flag. Wilson thus urges that we satisfy the innate longing for religious grounding with a cultural explanation derived from science.

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We humans walk and wheel and fly across vast landscapes that contain the bones of our ancestors, the shells and carapaces of distant cousins.

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Varieties of Ecoreligious Experience

In 1990, twelve years after Wilson published *On Human Nature*, 32 prominent scientists, led by Carl Sagan, signed "An Open Letter to the Religious Community." The manifesto briefly recounted the story of escalating human impact on the environment. "We are close," it said, "to committing—many would argue we are already committing—what in religious language is sometimes called 'crimes against creation.'" Problems of such magnitude "must be recognized as having a religious as well as a scientific dimension . . . . Efforts to safeguard and cherish the environment need to be infused with a vision of the sacred." The 32 scientists thus appealed to the world religious community "to commit, in word and deed, and as boldly as is required, to preserve the environment of the Earth."

Thus arose a coalition, the Joint Appeal by Religion and Science for the Environment, co-headed by Sagan and the Rev. James Parks Morton, dean of the Cathedral of St. John the Divine in New York City. In 1991 the group declared that the "cause of environmental integrity and justice must occupy a position of utmost priority for people of faith." The Joint Appeal, in turn, spurred the founding of the National Religious Partnership for the Environment, which includes US Catholics, mainline Protestants, Jews, and evangelicals. It encourages each of the faiths to build an ecological component into its tradition and then makes these products available to priests, rabbis, ministers, and other religious leaders.

In most quarters of Judaism, Christianity, and Islam, it is still heresy to consider trees and frogs and the earth itself divine. Yet

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it is perfectly acceptable to regard the natural world—the creation (usually now the *evolved* creation)—as a sacred work of divinity. We can then acknowledge our own negligence in failing to serve as good stewards of God's green earth.

The greening of traditional religious faith is a hugely important component of the ecoreligious movement. But there are other ways, as well, to infuse ecological concern with a vision of the sacred. The ecoreligious revolution is unfolding along five distinct—but not mutually exclusive—paths. These five may be called the way of reform (just discussed), the way of the ancients, the way of transcendence, the way of immersion, and the way of science.

Those who worship the earth directly, rather than through a creator, follow the *way of the ancients*. This path encompasses the nature religions of indigenous peoples everywhere and the revival of various forms of goddess worship. Those who suffer "the accident of being born to a culture that separates nature and home," as writer Richard Nelson describes the modern predicament, need not relinquish their own cultural heritage. By digging into the past, we may find roots more to our liking. For those of European descent, Celtic rituals are becoming popular. Those looking to add a feminine aspect to the face of the divine can call up the goddess worshiped by Old World agriculturists long before the herders entered into covenant with Yahweh. Some descendants of the African diaspora practice Yoruba religions.

Several widespread religions that are not "of the Book" don't require much (if any) reform to embody an ecospiritual component. For Buddhism and Taoism, for example, divinity already is in everything; we just don't notice it. The *way of transcendence* has a long tradition in which success in communing with "the One" is followed by a return to everyday life, with a newfound compassion for and urge to assist "the Many."

The *way of immersion*, which works through direct—even mystical—contact with nature, is available to one and all, whether we have an immense wilderness at our doorstep, a treasured tree in an urban park, or just a chance, for a moment, to float with the clouds through a window. Walt Whitman, Henry David Thoreau, John Muir, and William Wordsworth preached this faith not long ago, and their descendants are the growing family of storytellers and bards that includes nature writers Annie Dillard, Diane Ackerman, and Barry Lopez.

Finally, there is the *way of science*. This path draws primarily from the biological sciences—notably, evolutionary biology, conservation biology, ecology, and geophysiology—on the theory that the more we learn about earth and life processes, the greater our awe and reverence. Evolutionary biology in particular delivers an extraordinary gift: a myth of creation and continuity appropriate for our time.

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Evolution as Myth

"The evolutionary epic," writes Edward O. Wilson, "is probably the best myth we will ever have." Since I first read this sentence a decade ago, I have come to agree with its author—and then some. The evolutionary epic is indeed the best myth our kind has stumbled upon in its tens of thousands of years of weaving stories to explain this fabulous world and our place in it.

By *myth* Wilson means not *falsehood* but the grand narrative that gives us a placement in time—a meaningful placement that celebrates extraordinary moments of a shared heritage. Those of us who have not only learned but embraced the scientific story of our roots know ourselves to be reworked stardust, biological

M8, M20 and the Sagittarius star clouds. © Anglo-Australian Observatory/Royal Observatory Edinburgh. Photograph made from UK Schmidt plates by David Malin.

From Scientific Theory to Religious Ritual

Epic of Evolution rituals take modern science as their basis, unlike many pagan and other nature-centered rituals that promote ecological consciousness. And because they aren't tied to a particular heritage or landscape, Epic of Evolution-based rituals can have global relevance, blending into a wide range of cultures and secular or religious worldviews.

An Epic ritual may embody just a portion of the story of the cosmos or the story of life or culture, chronicling, for example, just the creation of the elements, the growth of living diversity on earth, or the gift of human creativity. An Epic ritual may also encompass the entire saga, beginning with the Great Radiance (one of several mythic names recently proposed to replace the unlovely scientific term the Big Bang) and calling forth celebration, praise, wonderment, and connectedness. Some versions of Epic ritual also move beyond celebration to build concern for fellow beings—particularly other species—threatened today by human actions.

beings with a multi-billion-year pedigree. We know these facts deeply, and for us they're as empowering as any tale that has ever come alive in the flames of a fire at the mouth of a cave or in the vaulting echoes of a cathedral. For us, the history of life and of the universe as told by science becomes more than a sequence of strange and arresting events. It becomes our personal and shared story, our creation story, our sacred story.

To call this story the "evolutionary epic," as Wilson has done, is to leap from textbook fact into meaningful extension. The evolutionary epic, in the hands of a scientifically faithful storyteller, is not fiction or fantasy. It is nonfiction in the same way that Wilson's exquisite books *On Human Nature* and, more recently, *The Diversity of Life* are nonfiction. The best nonfiction begins with a foundation of fact and then calls on the mind to find a story in it, a compelling and beautifully rendered story.

"To give you an example of how deeply I believe in the epic narrative, I wrote *The Diversity of Life* in epic form," Wilson tells me in an interview in 1996 at his Harvard office.

"And in your books and public appearances," I interject, "you are summoning the heroes—calling upon each of us to become a hero in some small way."

"That's exactly right," Wilson affirms, recalling the final paragraph in *Diversity of Life*: "Let us meet on the near side of metaphysics—call it Creation if you wish, call it the products of a billion years of evolution—but let us set those differences aside for the moment and agree that one of the great tasks of the immediate future is the saving of the very richness of life." Says Wilson, "I meant it to be an altar call"—a summons to believers to declare their faith.

In short, he believes that science offers humankind not only an awareness of the biodiversity crisis and the tools for saving species but also a story that can charge our very souls to take on the task. To succeed, however, the tellers of this story must draw from the wisdom of the humanities.

"It will not do to simply write a pedantic or a plainly worded book that tells the facts and the evidence," he says, "because where does that leave you? It's only when you strike the inner chords, the mystic chords of emotion, that you are making it possible to transfer some of the energy and seriousness that define provincial religious thought to a secular form. I don't see the poetry or literary style as just a contrivance to accomplish something—like moving a ton of earth or building a flying machine. I look on it as absolutely essential to the integrity of the human mind. So what we must have is poetry within the scientific, physical worldview."

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Those who would recount the evolutionary epic in a way that can "reanimate the deep emotions innate to the human mind" must be masters of compression. They must select from the voluminous facts just those that can best reveal the story of our coming into being and of the lush diversity surrounding us. A drama of fortune and crisis unfolds. There are turning points, close calls, moments of grace or exceedingly good luck. There are ancestors and heroes in abundance.

To be powerful, then, any telling of the story must include an interpretive meaning, but the meaning should be nuanced by a regard for the facts. It is crucial to remember that the first fish to set out across a tide flat in quest of a better pool—or, more likely, in desperate search of water, any water, when its own pool dried up—had no inkling that its effort would ultimately lead to feathered flight and cathedrals. Foresight is foreign to the evolutionary process. Thanks to a big brain, however, our species has the extraordinary gift of hindsight. We can render the history of life—even that of the universe—as a causally connected, meaningful sequence of events, just as we can retell

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The most potent forms of Epic ritual boldly enter the mythic realm, where poetic language, music, visual arts, drama, and movement are as crucial as the foundational science. Some Epic rituals introduce heroic features, even personifications. Paradoxically, the better we know objective science, the more willing we become to sanction—even welcome—such turns. The new field of evolutionary psychology teaches that mythic thinking is probably deeply ingrained in the evolved predispositions of the human mind. Those of us who follow the way of science can therefore wholeheartedly participate in mythic re-creation of our story, permitting the flame of a candle or the beauty of metaphor to move us deeply, as a dry recitation of facts could not.

The following Epic rituals can be conducted in a wide variety of ways, with more or less preparation, spontaneity, and group participation. The Epic of Evolution movement is so new, after all, that rituals are still in the formative stage.

THE COSMIC WALK. This most venerable and popular of all Epic rituals, created in the 1980s by Miriam MacGillis, of Genesis Farm—a Blairstown, New Jersey farm owned and run by Dominican sisters for the purpose of promoting ecospirituality and sustainable agriculture. The Cosmic Walk, first performed in Catholic communities, more recently has also found its way

our own personal stories in a meaningful way.

For example, I can identify in hindsight the public science lecture (by James Lovelock) that I attended in 1985 as the turning point that lured me away from a profession in energy economics back to my love of science. Had I not attended that lecture, I probably would not be a science writer and editor today. But I did not attend that lecture in order to switch careers. For several years thereafter, I read popular science for the sheer pleasure of it, only later making the leap. And I didn't become a science writer in order to write these words. In hindsight, however, the sequence smacks of predestination. Theologian Gordon Kaufman has offered a striking term that reminds us of this fanciful, fluky aspect of the evolutionary epic: "serendipitous creativity."

However one may wish to think of the evolutionary epic or its meaning, it surely sparkles as an adventure tale. Here we are, we humans today, surrounded by a singing and slithering and flitting urgency of existence that is all our kin. Here we are, walking and wheeling and flying across vast landscapes that contain the bones of our ancestors, the shells and carapaces of distant cousins. Here we knowers are, as Wilson puts it, "life become conscious of itself," or as biologist Julian Huxley expressed it, "evolution become conscious of itself."

The meaning of the epic, Wilson insists, "is what we choose to make it mean." If we choose to celebrate this living stream that fashioned itself out of atoms, if we choose to revel in the adventure and to envision ourselves as life, or evolution, waking to an awareness of the breadth and depth of existence, then what science gives us in the way of spiritual fare is extraordinary. That awareness is "one of those few phenomena in the universe as we know it," Wilson tells me, "that remain utterly stunning in a literal sense—it stuns the mind to think of ourselves in this way."

The Epic of Evolution

Act I: Cosmic Evolution in the Universe

Only recently have I come to appreciate the pre-life stages of the evolutionary epic—owing in large part to the writings and videos of Brian Swimme, a mathematical cosmologist based at the California Institute for Integral Studies, where he teaches when he is not a featured speaker at conferences and on the lecture circuit. Swimme urges us to "enter the solar system" by treating sunset and sunrise as opportunities to experience the rotation of the earth, "like standing on the back of a great whale." He urges us to initiate our youth by taking them out into the dawn to greet the sun, while we elders tell the story of this star's gift. He suggests these and other experiential exercises because "if you do not experience the universe directly, it doesn't matter at all what you believe about it."

The other star Swimme has enticed me to get to know is one he (with the help of co-author Thomas Berry) named. This is the star that singer and songwriter Joni Mitchell surely meant when she composed the anthem of my generation: "We are stardust, we are golden. And we've got to get ourselves back to the garden." We are indeed reworked stardust. Scientists first got an inkling of this shimmering fact in the 1950s. We now know that every element on earth and in our bodies that is heavier than hydrogen and helium was created in the bowels of a supernova that blew up in this sector of the galaxy some five billion years ago. Swimme and Berry call this ancestral supernova *Tiamat*, after the original divine being in an ancient myth of the Middle East. Tiamat's rending (by her ungrateful son) is what gave rise to the great binary of the cosmos that has impressed virtually all peoples: the split between heaven and earth. (See sidebar p. 18 for a ritual commemorating these events.)

In addition to the event that has unfortunately come to be known as the Big Bang—I prefer Great Radiance, a name invented by children's author Philemon Sturges—another unique event in the epic stressed by Swimme is the formation of galaxies. Stellar formation and stellar death are ongoing, but the galaxies happened only once. No new galaxies are being formed today. Through the most powerful telescopes, we do have the privilege of observing some very young galaxies—but only because they are so far away that the light we receive from them today began its journey billions of years ago. Who knows what those galaxies look like now? The same mystery even surrounds the stars in our own galaxy: A casual gaze into the night sky reveals a surprising depth in time as well as a vastness in space. The photons from the closest star of the night sky, Alpha Centauri, began their journey four years ago; the photons from the most distant celestial presence discernible through binoculars, the Andromeda Galaxy, set out more than two million years ago. Who knows how the stars that generated those points of light may have changed in the meantime?

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into Quaker circles and been performed at ecological and earth-centered gatherings of an ecumenical or secular cast.

Ritual core: Participants walk a pathway along which key evolutionary events are posted (for a large group) or narrated (for a small group) in chronological order—e.g., "460 million years ago, organisms learn to live on land; leaving the water, organisms seek the adventure of weather and gravity. . . . 150 million years ago, birds emerge; the earth learns to fly."

Materials: Because this ritual is a walk, an indoor or outdoor setting must be equipped to guide the walkers. A labyrinth may be ideal, but a simple rope can be laid in a spiral or threaded through a room or forest. Event markers must be prepared and positioned in advance, enhanced by candles and perhaps other objects. Usually music plays in the background, often Mike Rowland's "The Fairy Ring."

Participation: This ritual has been conducted with as few as a half dozen and more than a hundred. It is perhaps the ideal introduction to the Epic of Evolution and Epic ritual, as it teaches the full sweep of the scientific story.

THE TIAMAT STORY. I invented this ritual in 1996 to give unchurched members of my family a religious practice for winter solstice or Christmas Eve. (The star motif of this ritual works well at that time of year in our culture.) Since then, the ritual has

Act II: Biological Evolution on Earth

On earth, unique events abound. They are ripe for mythmaking. All organisms alive today ultimately owe their existence to a single ancestral Ur-cell. A mid-century evolutionary biologist, Theodosius Dobzhansky, and many others have extolled this "unity in diversity" that a knowledge of life history has brought to us.

In turn, speciation is a one-time- only happening. The chance mutations, the chance survival, and the selective forces that shape a new lineage through time are astronomically unlikely to recur. And except for clones, each organism is a one-time-only event, a unique cocktail poured from the gene pool of an interbreeding population.

But at the level of species, what astonishes us most is not that nature has produced singularities but that repetition is rampant because of the phenomenon of convergent, or parallel, evolution. The most famous example is the breadth (and detail) of similarities between the marsupial mammals of Australia and the placentals elsewhere. Show a Tasmanian devil to an Alaskan, and you'll be warned to be wary around that vicious wolverine. Produce a photograph of a thylacine (sadly, extinct in just the last few decades), and the animal will be pronounced a wolf—though a wolf with an unusual tiger-striped pelt. Now tell your Alaskan friend that wolverine and wolf are more closely related to a mouse (or a musk ox, or even a whale) than they are to the devil and thylacine, and you will arouse either astonishment or derision.

Convergent evolution is good material for mythmaking. Whereas biological singularities express the whimsy of the cosmos, the chance of mutations, convergences suggest there are powerful functional attractors that selection drives toward or powerful developmental pathways that are simply in the nature of things. George Gaylord Simpson, one of the great evolutionary biologists of a half century ago, presented a striking example of convergence in one of his popular books promoting the evolutionary worldview. Wings, he reported, have developed from forelimbs three distinct times: in the reptilian pterosaurs that were contemporaries of the great dinosaurs, in the birds, and in mammalian bats. We now know that the story of winged convergence is even grander than Simpson's portrayal, because a fourth independent origin has been discovered. The largest of the tropical fruit bats, the so-called flying foxes, hail from a distinct lineage that evolved wings on its own.

The most celebrated example of convergence in the animal kingdom is the eye. In fact, the intricate and exquisite eye has long been treated as evidence not of evolution but of divine design. The ease of optic evolution is suggested by the widely held view that organs for discerning light from dark, for detecting movement, or (at the top end) for discerning shape and pattern have arisen independently in at least 40—and possibly 60 or more—different lineages.

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The list of evolutionary accomplishments is endless. There is the mystery of spider silk, which offers a tensional strength that human technology cannot even begin to match. There are the fish and worms that thrive in the ocean benthos, in the darkness at pressures of a thousand atmospheres. There are the petaled and plumed extravagances of sex. There are sensory accomplishments in abundance: the sonar of whales and bats, the ultraviolet vision of bees, the heat-sensing facial pits of vipers, ubiquitous biological clocks. There are fishes armed with electricity, moths that can taste a pheromone miles from its point of release, magnetically tuned and celestially calibrated migrating birds. Knowledge of all these wonders has been made available for human delight by science.

Singularities like the origin of life and the birth of new species; multiplicities like convergent evolution; evolutionary accomplishments of sensation and execution; generation upon generation of persistence and change—all these stoke our awe. But what is the point of this pageant? Is there a story here?

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also been used in larger groups.

Ritual core: This telling of the story of the universe boldly personifies key events as heroic characters, following the example given by Brian Swimme and Thomas Berry in their 1992 book *The Universe Story*. The name Tiamat comes from the primordial being in the ancient Babylonian creation myth whose sundering brought forth heaven and earth. Swimme and Berry give this mythic name to the magnificent star that, preceding our own sun, created all the heavy elements in its roiling core and then exploded as a supernova, releasing all these elements into the galaxy. The Tiamat Story ritual may end with the creation of elements, or it may continue on with other heroic characters, such as the Prophet of Planetary Futures, the Spark of Life, and the Magic of Mind. In the ritual, storytellers act out their roles, as in "I am the great star Tiamat. Behold! Behold!"

Materials: No materials are required, but masks and even costumes may encourage participants to step out of their everyday demeanors. When the ritual takes place indoors, candles and other accouterments may help set the mood.

Participation: This is not a ritual for the fainthearted. In addition to recruits who play the main characters (reading prepared

Wilson's Harvard colleague Stephen Jay Gould and many other biologists believe that the pageant itself is the point. No deeper meaning need be construed. Charles Darwin himself took this perspective. "There is grandeur in this view of life," he wrote in the last paragraph of his great work, *The Origin of Species*. "From so simple a beginning endless forms most beautiful and wonderful have been, and are being, evolved." Some biologists, however, like to stand back and look at the whole of life splashed across the surface of earth and roiling in time in order to glimpse something further—something less certain than continuity but perhaps more alluring. Something emerges for these scientists: a story.

Julian Huxley's writings of a half-century ago tell a stunning story of evolutionary enrichment, as life pioneers new environments and new ways of making a living. "During the course of evolution in time," Huxley interpreted, "there has been an increase in the control exerted by organisms over their environment, and in their independence with regard to it; there has been an increase in the harmony of the parts of organisms; and there has been an increase in the psychical powers of organisms, an increase of willing, of feeling, and of knowing." Today, biologist Richard Dawkins tells his version of the story with panache. In his view, the scientific story of life "outclasses even the most haunting of the world's origin myths." Referring to the scientific understanding of our own cells as descendants of communities of bacteria that symbiotically merged into a now-inseparable union, Dawkins finds the idea of "the cell as an enclosed garden of bacteria incomparably more inspiring, exciting, and uplifting than the story of the Garden of Eden." Dawkins scrutinizes the story of life and discerns 10 major thresholds, beginning with the birth of the first molecule able to reproduce itself, thence to the first enclosed cell, onward eventually to the many-cells threshold, nervous system threshold, consciousness threshold, language threshold, cooperative technology threshold, radio threshold, and the space travel threshold. A big part of the story of life for Dawkins thus resides in the human realm--which takes us to Act III.

Act III: Cultural Evolution in the Human Realm

There is something to be said for the claim that humankind is just another animal, a third species of chimpanzee, better classified as *Pan sapiens* than *Homo sapiens*. There are times when the view that we are just another member of the biosphere—no more worthy than an ant or snail—will put us in the mind-set for doing the right thing. But there are other times when it makes sense to acknowledge our special and unprecedented mental gift, whose dark side is our special and unprecedented capacity to do harm.

This is where Brian Swimme's collaborator the cultural historian and Passionist priest Thomas Berry comes in. Berry leaps beyond Wilson and Huxley. For Wilson, remember, humankind is *life* become conscious of itself. For Huxley, humankind is *evolution* become conscious of itself. But for Berry—who calls science "the Yoga of the West" and classes it "among the most sustained meditations on the universe carried out by any cultural tradition"—humankind is *the universe* become conscious of itself.

Act III of the epic, then, is the emergence of mind. Mind, of course, precedes and parallels human evolution. But it is the human who comes most richly endowed with, and has most exploited, this novelty of creation. Mind leads to culture and thence cultural evolution, which proceeds at a pace that leaves genetic evolution in the dust, as we pass down what we've learned to the next generation.

What this means is that in Act III of the evolutionary epic, humans, unlike other life forms, can act with restraint to ensure that the biological pageant continues. We can use foresight to assess the long-term consequences of actions that the reptilian portions of our brains and our own Pleistocene heritage dangerously urge us to pursue. We can even project into the cosmos goals we shape from the meanings we make of the evolutionary epic.

In Act III, then, the meaning-makers of the cosmos enter. Stunned by the beauty and mystery that surround them, they create stories in an effort to understand who they are, where they came from, and what things matter. Later, stunned by the cosmic adventure revealed to them by science, their own creation, the meaning-makers falter, confused by conflicting stories. Perhaps they will soon reawaken their faith and become busy with new constructions: celebrating the epic of evolution and conscientiously using culture for the good of the whole earth community. Life, evolution, the universe can then become exuberantly conscious of themselves. Then everything will matter. ❖

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parts or extemporaneously delivering their own soliloquies), participants are invited to step forward in turn to take on the role of an element, a planet, a life form, or an aspect of mind. For example, following Tiamat's invitation to the group ("You and you and you and you and you are the elements tonight. Now tell us who you are and why you bring us delight"), someone might step forward and say, "I am oxygen. Without me you could not breathe. I am oxygen," and so on. Each segment of the story concludes with a version of what has come to be known as the "Tiamat Song," adapted from a pagan chant, which can be learned quickly and sung by the whole group.

There are several other popular rituals. Two of them are

- A group reenactment of our animal journey from fish to amphibian to reptile to mammal to aerial primate to human. A leader guides participants through a series of movements to suggest what it might have felt like to be each life form.

- *Hidden Heart of the Universe*, experiential exercises suggested by Brian Swimme (in his recent book of that name) to help participants bond with the sun and other parts of our galaxy.

—C.B.