The Way of Science

by

Connie Barlow

Not long ago it was intellectually fashionable to declare that religion's time had passed. Religious experience—and, even more so, religious dogma and superstitions—were regarded as drags on human progress. Supernatural belief bound the individual to pre-rational states of consciousness and choked societies with doctrines invented in pre-modern times. Marxists assailed skyward-looking religions for lulling the downtrodden into accepting a wretched existence here on Earth. Nietzsche proclaimed, "God is dead." Meanwhile, secular humanists held a mirror to themselves, turning to humankind and human culture as the only aspects of heaven and Earth worthy of reverence. We ourselves were the beginning and end of all meaning and value.

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. Joseph Campbell, who held that religion was whatever put one "in accord" with the universe, delighted in the mythic metaphors of diverse religious heritages while savaging those who corrupted the metaphor by claiming its material truth. For Huston Smith, religion is that which "gives meaning to the whole." Lawrence Kohlberg judged religion to be that which "affirms life and morality as related to a transcendent or infinite ground or sense of the whole." Theologian James Gustafson puts forth a definition of religion that is as accessible to atheists as to theists and that, moreover, offers possibilities for making peace with the Earth. In Gustafson's view, the religious capacity manifests 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). Note, therefore, that one need not be a theist to be counted among the religious. Rue is such an example; his religion, which is shaped from a scientific (specifically, evolutionary) understanding of the cosmos, is *religious naturalism.*

The human religious capacity is also being taken seriously today in part 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

Jacques Monod was a molecular biologist who combined the authority of a Nobel laureate with a passion for philosophy and a gift for words. In his 1971 masterpiece, *Chance and Necessity,* Monod surmised that the capacity for religious experience and the hunger for religious explanation were molded by the same force that shaped our opposable thumbs: natural selection. Evolution of mental capacities that bolstered group cohesion beyond the innate genetic concern for close relatives would have helped members

of larger groups cooperate for the good of all. Scientists writing after Monod recognized that even if loyalty, valor, and the surety of meaning offered by religious belief took a toll on the fitness of warriors who died defending the tribe, such seemingly altruistic acts nevertheless benefited copies of warrior genes carried in the chromosomes of remaining kin. Members of groups made coherent and strong by shared religious conviction thus would have been favored by evolution. "We are the descendants of such men," Monod wrote. "From them we have probably inherited our need for an explanation, the profound disquiet which goads us to search out the meaning of existence. That same disquiet has created all the myths, all the religions, all the philosophies, and science itself."

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That this "imperious need" is inborn, Monod continued, that it is now inscribed in the genetic code, "strikes me as beyond doubt." Through the millennia, not only the capacity but also the need for a religious framework entered our very DNA. The drive to find or construct a complete explanation by which to orient ourselves and our goals in the universe is thus innate. Its absence, Monod cautioned, "begets a profound ache within."

Edward O. Wilson took up where Monod left off. In 1975, with publication of a massive tome entitled *Sociobiology: The New Synthesis*, Wilson founded a new branch of science. Sociobiology draws from the fields of evolutionary biology and population biology to explore the evolutionary roots of all sorts of social behaviors in animals—from mating rituals and dominance hierarchies expressed in many species to the very few forms of behavior and emotion that seem to have no analog outside our own kind. Sociobiology thus looks at social behavior from an adaptationist standpoint. How, for example, does an instinct to whistle an alarm call help a prairie dog propagate its genes? How might deception—even self-deception—enhance the evolutionary fitness of an ape?

A few years after publishing *Sociobiology,* Wilson left prairie dogs and chimpanzees behind to focus on the human species. In so doing, he widened his scope to include matters of 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, going well beyond the groping ideas that fellow biologist Jacques Monod had pioneered.

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 the 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.

However one chooses to flesh out the traits of religious capacity, the "collision between scientific materialism and immovable religious faith" noted by Wilson is undeniable. Fanaticisms on both sides of the divide are all too evident. And the casualties—those whose spirits are vacant or fulfilled mostly in shopping malls—greet us on buses, in the workplace, in our homes, inside our own skulls. The clash ensues because "our schizophrenic societies progress by knowledge but survive on inspiration derived from the very beliefs which that knowledge erodes."

What to do?

Wilson makes a daring proposal. To reconcile science and religion 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. Here Wilson parts company with Monod, who felt that human-centeredness was the only way to cope with existential despair. Not so, counters Wilson. 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 is not science; it is science extended into the realm of meaning. In such 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. That explanation would be based on the evolutionary epic. It would incline us, Wilson hopes, to dedicate a good portion of our religious zeal to reverence for the vast diversity of life produced by nearly four billion years of struggle and symbiosis on Earth. By the way of the evolutionary epic, we can redesign our prescriptions for spiritual allurement and

atonement, and we can revisit questions of ultimate meaning and value.

All this is possible because the capacity for religious experience and explanation is just that—a capacity. Genes do not tell us how the world came into being. Genes do not determine what we revere. These crucial details are, rather, the workings of the cultural counterpart of genes: memes.

The term *meme* is the brainchild of evolutionary biologist Richard Dawkins. Examples of memes are "tunes, ideas, catchphrases, clothes, fashions, ways of making pots or of building arches," Dawkins explains in *The Selfish Gene.* "Just as genes propagate themselves in the gene pool by leaping from body to body via sperms or eggs, so memes propagate themselves in the meme pool by leaping from brain to brain." The term is an artful invention, given its sound resemblance to *gene* (*meme* rhymes with *theme*) and its etymological connection to words such as *mimetic* and the French word *même* (meaning "same"). The meme of *meme* is now wildly successful. Writers who normally have no truck with evolutionary biology or any other science now find it indispensable. Memes are what give substance to our inchoate capacities for religious feelings. Whether they enter our minds by thoughtful or thoughtless invitation or by indoctrination, particular memes are usually what we judge when we speak of religion in friendly or unfriendly ways.

Overall, even if the mythopoeic drive and other vestiges of the religious are innate, it seems to be a cultural choice whether these are expressed through memes that will impair or enhance our bond with other species and with Earth itself. Both nature-phobic and nature-philic religious memes are evident in the world today. We do have a choice. Moreover, the choice may be genetically slanted in favor of what, in today's vernacular, would be called *green.*

Here Wilson is again a pioneer. He has suggested that a desire to associate with, even to love, living things is not just a cultural choice. In his 1984 book *Biophilia,* Wilson claims that "to affiliate with life is a deep and complicated process in mental development. To an extent still undervalued in philosophy and religion, our existence depends on this propensity, our spirit is woven from it, hope arises on its currents. Wilson's "biophilia hypothesis" may be highly speculative, possibly unconfirmable, but the idea that love of living things may be genetically imprinted in human nature has been a smashing success. The terminology has caught on, the hypothesis is talked about, and the beginnings of a research program in biophilia are evident.

If humans do have an innate capacity for biophilia, how can it be nurtured? Is biophilia similar to language acquisition—is it a capacity that must be exercised in childhood in order to bloom? Will that capacity wither if we are not exposed to the bounties and delights of living things at an early age, just as the language capacity withers for want of conversation? These and other scientific questions about biophilia are of more than academic interest. The answers will influence the direction of environmental activism.

Biologist Jared Diamond—no less than Wilson a proponent of biodiversity protection—has his doubts about the reality of biophilia. His long association with tribal people in New Guinea, whom he has come to know during his birding expeditions to remote forests, makes him question the rosy view of biophilia. New Guineans are extremely knowledgeable about the biological landscape; hunting and gathering are ways of life. But their treatment of animals can be ghastly. He gives several examples: extracting bones for nose ornaments from the wings of live bats; keeping snared animals fresh by transporting them alive, but preventing escape by breaking their legs; immobilizing cockatoos by bending wings behind their backs and tying the feathers.

Why would Diamond offer as evidence against Wilson's hypothesis the apparent absence of biophilia in one small tribe in New Guinea? What about the love of living things evident in the goldfish ponds of Japanese gardens, in the myriad backyard bird feeders of suburban America, in the altogether new concept of "animal rights"? The answer is that hunter-gatherer cultures are where we must look to assess whether any psychological trait has a genetic basis. The field of evolutionary psychology (a subset of sociobiology in which humans are the focus) builds its hypotheses on the notion that our psyches were honed by the hundreds of thousands of years our lineage spent in the Stone Age. Our brains have had little time to adjust to modern exigencies. If love of living things finds its fullest expression in cultures where the discomforts and outright dangers of the natural world have been removed from everyday life, perhaps biophilia is a cultural emergent.

Unlike biophilia, religious qualities do seem to be common to all cultures. The mythopoeic drive, a sense of the sacred, and other manifestations of the religious are thus even more likely than biophilia to have a strong genetic component. Likelihood is not, however, certitude. Even if a human capacity is found to be universal, there is still a danger in granting it a genetic basis. That all hunter-gatherer cultures know how to fleck flint, for example, does not mean that flint flecking is an inborn capacity. Cultural inheritance from a single moment of innovation during the evolution of genus *Homo,* multiple discovery, or even borrowing—not chromosomes—probably keeps this particular skill going. How, then, could we possibly know that the mytho-

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poeic drive, but not flint flecking, has jumped to the genes?

Maybe it doesn't matter.

Whether an adaptation, exaptation, or cultural inclination—whether expressed through memes that are reasonable responses to an only partially known reality or just fantasy—the religious urge today is rising like the phoenix. The upsurge in spiritual (and outright magical) tendencies in the former Soviet Union, the attraction of fundamentalist doctrines in the Middle East, and the trend in my own generation in America to head back to church or into a coven is empirical evidence that the religious capacity must be taken seriously.

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Varieties of Ecoreligious Experience

Religious memes that can soothe the inevitable human-to-human, group-to-group, and nation-to-nation tensions in an increasingly crowded but interconnected world are surely worth every bit of support each and every human culture can muster. Our kind has been searching for ways to foster goodwill ever since we invented the concept. Umpteen versions have been tried and tested. And the sad fact is that faiths and creeds that promote the most brotherly love may not be so good for sisters. Those that stress compassion may not always be the best at getting the fields plowed and warding off ill-intentioned intruders. Those that promote peace and harmony within the group may be bloody terrors without. More to the point, improving the human-to-human relationship is far beyond my ken. Rather, I look for new ideas about meaning and value that might improve the human-to-Earth bond. Here lies the mythopoeic and ethical frontier. If we can better our human-to-Earth relations to the point where waters regain their health, eroded hillsides recover, and the terrain is not scavenged for every last burnable and edible, then the human-to-human tensions will be all the fewer. Those of us who choose to focus on earthly concerns are not, therefore, turning our backs on human needs.

In 1990 thirty-two prominent scientists, led by Carl Sagan, put their signatures to a document entitled "An Open Letter to the Religious Community." Freeman Dyson, Stephen Jay Gould, Motoo Kimura, Lynn Margulis, Peter Raven, Stephen Schneider, and Victor Weisskopf were among the signatories. The manifesto briefly recounted the story of escalating human impact on the environment. "We are close 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 thirty-two 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."

The appeal was answered by several hundred religious leaders of all major faiths and from around the world. Thus arose a coalition—the Joint Appeal by Religion and Science for the Environment—coheaded by Carl Sagan and 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 coalition has since produced a number of aids for religious networking and for environmental education. The Joint Appeal, in turn, spurred the founding of a new organization: the National Religious Partnership for the Environment. This partnership includes national-level groups representing Catholics, Protestants, Jews, and Evangelicals in the United States. 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.

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. There are other ways to fill the perhaps innate drive for religious grounding with memes that can serve the Earth community. 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 warm to the idea of worshipping Earth directly, rather than through a posited creator, can follow the *way of the ancients.* This path encompasses the nature religions of primary peoples everywhere and the revival of various forms of earth goddess worship—thus the attraction of Native American and Aboriginal Australian rites of passage and views of the sacred. But those who suffer "the accident of being born to a culture that separates nature and home," as Richard Nelson (*The Island Within*) describes the modern pathos, need not relinquish their own cultural heritage. By digging deeper into the past, we may find ancestral roots more to our liking. For those of European descent, Celtic rituals for marking the quarters and cross-quarters of the calendar are becoming popular. For the descendants of the African diaspora, the practice of Yoruba is an option.

Several widespread religions that are not "of the Book"

require little (if any) reform in order to embody an ecospiritual component. Buddhism and Taoism are commonly cited as examples. Meditational practice inspired by Eastern religions is, however, sometimes viewed as narcissistic by action-oriented environmentalists, especially if the all-consuming goal is higher states of consciousness for oneself. Nevertheless, 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 new-found compassion for and urge to assist "the Many."

The *way of immersion* works through direct—even mystical—contact with nature. This form of ecospirituality 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. Something deep within us is brought into communion with the mountain, the tree, the cloud. Walt Whitman, Henry David Thoreau, John Muir, and William Wordsworth were exemplars of this faith not long ago. Today Annie Dillard, Diane Ackerman, Barry Lopez, and Richard Nelson are among the growing family of storytellers and bards who offer us their own experiences. The prophets of the way of immersion can urge us on, but we are all deliciously on our own, for this is a doctrineless path.

Finally, there is the *way of science*. This path draws primarily from the biological sciences—notably, evolutionary biology, conservation biology, ecology, and geophysiology. The more we learn about Earth and life processes, the more we are in awe and the deeper the urge to revere the evolutionary forces that give time a direction and the ecological forces that sustain our planetary home. Evolutionary biology delivers an extraordinary gift: a myth of creation and continuity appropriate for our time. This is the grand sweep of the evolutionary epic. Evolutionary biology and conservation biology together introduce us to our farthest-flung kin, promoting knowledge and valuing of biodiversity throughout the world. We relish life in all its multifarious forms. Ecology, in turn, has a presence in the bioregional movement. Deep reverence is accorded the particular watersheds, nutrient cycles, and biological communities that are the lifeblood of particular human communities. Finally, geophysiology, including Gaia theory, has reworked the biosphere into the most ancient and powerful of all living forms—something so much greater than the human that it can evoke a religious response.

Science and Meaning

The attraction of science is both its beauty as a heritage and its prospects for change. School textbooks, unfortunately, sometimes render science as dogmatic as any fundamentalist doctrine. In truth, science is quintessentially open. It is open to revision, to new ideas. Much of what is truly of interest to the philosophical quester is likely to be (and to remain) in the throes of controversy within the scientific community. Respected authorities will favor utterly different theories. For example, there is now no question that biological evolution is the means by which species were created. But which aspects of the pageant of living forms that have graced this planet are due to chance and which to interior or exterior shaping that would have worked the same sculpture in any lump of clay? Choose your authority (Stephen Jay Gould or Stuart Kauffman, in this case) and thereby choose your answer. Choose your answer and thereby choose your worldview.

Science is also open to interpretation. Scientists can tell us what is and what was and perhaps even what will be, but not what it all *means.* For example, Big Bang cosmology has been almost universally accepted within science. Even so, it is up to each of us to decide whether we feel welcome or alien in that sort of universe and what role, if any, a theistic or deistic god or spiritual influence may play in it. Science is thus one of the most important bases for meaning-making in today's world. The meaning drawn out of science by each individual who treads this path is a constructed, but not arbitrary, product of the human imagination. Despite the inherent subjectivity, meaning-making is not mere fabrication. It is a response to, a declaration of relationship with, Earth and the cosmos. To find meaning in the cosmos is no less legitimate than to have an aesthetic response to a landscape. Others may have a different response, but to be fully human is to have a response of some sort.

So far as can be known, we are the only beasts blessed and burdened with a mythopoeic drive. According to the historian of myths, Mircea Eliade, we are not *Homo sapiens;* we are *Homo religiosus.* The mythopoeic drive may be inborn or culturally induced, or we may stumble on it in the playful exercise of our minds—noticeable even in young children. Whatever its genesis, the fulfillment of at least a portion of religious capacities may be essential. Our mental health may depend on it, as may the continuation of our species and many others.

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The practice of science, as well as its interpretation, is a community effort. No single researcher is obliged to entertain all hypotheses and pass judgment unmarred by emotions or philosophical inclinations. Quite the contrary. Science proceeds by skirmishes between members of conflicting research programs who are often at one another's throats. Submitting a paper for peer review in a controversial field is not for the faint-

hearted. Those who have the courage to enter the fray may be empowered by conviction as strong as that of any believer. If their ideas turn out to be wrong, they will leave a legacy of little-cited papers. If they happen to be right, they will win the only kind of immortality most scientists believe possible. Pigheadedness, the self-serving quest for glory, and other all-too-human tendencies held in low esteem (short of theft and fraud) can therefore yield exemplary results when judged and checked by a community of peers. One need not emulate the means to admire the ends. For many of us, even the squeaky clean image of "the scientific method" that we learned in textbooks is unattractive—pallid and dehumanized. *I* may not yearn to be a scientist, but thank goodness some do. Ah, what I can make of the results! In turn, I need not approve of all the technologies drawn out of scientific knowledge in order to applaud the continuing adventure of the scientific quest.

The way of science as a spiritual path thus does not demand allegiance to the methods by which new scientific knowledge is discovered or promoted. Nor does it require one to embrace all the applications of that knowledge. The way of science turns on ideas. It presents to us a picture of the world that we then interpret. Its most exacting demand on a seeker is a good measure of tolerance. The world is real; our scientific ideas about the world are a pretty good (and getting better all the time) approximation of the real; but our interpretations of meaning and value are largely constructions. Some interpretations may be more plausible than others. Some may be more useful. Some may provide us with a greater zest for living and acting with commitment.

The way of science is also a bit dangerous for those who don't relish the idea of having to trade in their worldviews from time to time. This is because meaning-making not only emerges in the human realm; it evolves. The way of science may offer the greatest challenge when the news makes us uncomfortable. Overall, those who find their sacred text in nature must be able to live with errata sheets. I remember the psychological loss suffered and the limbo endured when I had to trade in a homeostatic version of Gaia theory a few years ago for a more developmental view of Earth's climate and chemistry. Eventually I found the developmental view to be even more to my liking, but it took a while for me to work up the new interpretations.

Fundamentally, I look to science as a way of extending my experience. Science can't take the place of a hike back Redtail Canyon. But science can carry me to a coral reef in Australia later that evening or to the Andromeda galaxy. Acquiring knowledge about the carbon cycle is no substitute for a stroll in the woods, but it has many times enhanced that stroll, as I stretch my imagination to follow the breath that I know flows between the trees and me. Fossil bones and traces can't take the place of wide-eyed deer or sun-drenched cottonwoods, but an awareness of the past as revealed by paleontology surrounds me with ghost species that have an eerie presence.

I remember the thrill of encountering a cliff along Puget Sound in which I could read fires and storms in the sediments. I remember the sorrow of driving across Iowa, slicing through a northward wave of migrating Monarchs—my sadness deepened by knowledge (acquired by scientists just twenty years earlier) of how far those butterflies had come and how far they were determined to go. Ultimately, I have not just my human experience but a bit of the tanager, the mantis, and the yucca blossom that waits for one nocturnal moth. And I am not limited to just these forty-five years. Through science I have gained memories of animal ancestors that reach back six million centuries. A little more hazily, I recall highlights of my cellular journey long before the first chordate.

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