

Scientific Spirituality

The ancient Greek word for science was philosophy -- *philos sophias*, lover of wisdom. This name was intended to set science on a course of searching for wisdom, for practical guidance in human affairs through understanding the natural order of the cosmos to which we belong. It was exactly this search that drew me to study science and continues to motivate me, though it was a long time before I found any other scientists who shared it, most of them having accepted the belief that science should be neutral -- free of values and social intent -- or that the ever new technologies spawned by science are all humanity needs to solve its problems and continue its "progress."

I became an evolution biologist, a student of life with a very long-term perspective. Evolution fascinates me because it gives meaning to humanity in an awesomely grand context and offers guidance for our future. But my even broader lifelong passion as a scientist is to make sense of *everything* in my entire experience of self, world and cosmos. I yearn for a new and inclusive scientific model of reality that does not separate my experience of this physical world from my spiritual experience of life, my heart's life story from that of my mind.

Ever working toward such a new worldview, I seek out other scientists, philosophers, clergy and generally broad-minded people as friends and colleagues, continually seeking new insights and angles for a model of reality that can serve *everyone*, that can be understood and *loved* by anyone in our whole global community -- a truly meaningful and *appealing* story of reality that gives people some helpful guidance in living fulfilling lives both individually and together in the context of our beautiful and sacred Earth -- the kind of story the ancient Greeks sought, but one that includes everything learned since their time.

Everything in our human experience takes place within our consciousness and is shared as social reality through stories. In our scientific story the Earth evolves as its creatures evolve, and we humans are among them. We ourselves evolve, and so do all our human endeavors from governance to the arts, from education to law, from science to religion. Most of my life has been lived in what has become the dominant human culture of Earth, at first a Christian European culture, then an American culture with Native American roots, bringing in Africans, then Asians, Latinos, Jews, Muslims, Buddhists and so on to so many languages and spiritual traditions and concepts of reality that we can no longer sort them out. Perhaps in unwitting anticipation of all this wonderful spiritual diversity, my culture has stayed with its European forefathers' decision to give science the role and responsibility of a supreme priesthood. Historically, every culture has had its religion, with a priesthood that explained reality in terms of their religious beliefs. In today's dominant world culture, science explains reality in terms of scientists' beliefs.

The difference between religious and scientific "realities" lies in the difference between revelation and research. In any religion the story of reality -- of "How and Why Things Are" -- comes through revelation to certain people who write or inspire texts and develop a following, including priests who carry the story to succeeding generations of believers. In science the story of "How and Why Things Are" is arrived at by people trained to propose and test models of Nature that become scientific reality. The models (or theories) suggest questions to be answered by experimental tests to see whether the model is valid, and to gain clues for revising it if it proves not to be.

Science is thus expected to change, while in practice that is not so easy. Religion is expected *not* to change, and in practice, that is not so easy, either. It seems there is pressure on both to evolve as the Earth and its people evolve.

Resistance to change among scientists is deeply rooted in holding unquestioned but fundamental assumptions -- in forgetting that these assumptions did not come by cosmic revelation, but that European men of science devised them. They were men enamored of machinery, projecting their own engineering expertise onto God by calling Him the Grand Engineer, and thus seeing all of Nature as lifeless machinery. Later, when they decided they had no need of God and made science a completely secular venture, the concept of machinery without an inventor forced them to believe natural machinery could assemble itself by accident. Their fundamental assumptions, therefore, were belief in a mechanical universe, a great cosmic clockworks assembled from the bottom up by accidental collisions of particles into atoms, atoms into molecules, and so on all the way up to galaxies and galactic clusters, to the whole universe. Just like manmade machinery that rusts and disintegrates if left to its own devices, they "proved" by the Law of Entropy that this lifeless, non-intelligent, unconscious mechanical universe was running down to its ultimate cold death of nothingness.

In this scheme of things, this scientific model, life is a peculiar accident arising from non-life, as intelligence arises from non-intelligence and consciousness emerges from non-consciousness late in evolution. Despite the past century's enormous changes in the physics describing our universe, this fundamental story is still assumed. Even quantum theory, which dissolved all the hard bits and pieces of the universe into energy waves, is discussed and seen as quantum *mechanics*.

In the life sciences, evolution theory placed man squarely into the natural world, where the notion of "survival of the fittest" had huge social implications. It justified taking everything we could from Nature -- now seen as a collection of *our* "natural resources" -- in an aggressive and competitive struggle among humans to get what we can while we can in this meaningless, entropic universe. Thus children were chained to machines for the sake of profits, wars were fought over resources, the holocaust was designed to weed out the "unfit" and the quarterly bottom line is our newest competitive tyranny, preventing corporate CEOs from being accountable to planet and people in their drive to maximize financial profit.

Now, at the dawn of a new century and a new millennium, we find ourselves stuck in a scientific worldview that leads us into ever more destructive modes of existence without any guidance toward wisdom. Our behavior, guided by this worldview, actually threatens our own extinction as a species! Global warming and other disruptions of Earth's weather

systems and climate, mass starvation and disease epidemics, new threats of nuclear, religious, oil and water wars, environmental toxins and waste buildup, genetic engineering disasters, soil degradation and erosion, water pollution, increased discrepancies between extremes of poverty and wealth, etc. vie for status in our arsenal of species suicide weapons. Yet, we know in our hearts and minds and in our very bones that crisis looms so large now that we can no longer ignore it, that things *must* change quickly before it is too late.

As overwhelming as the crises appear to be, I believe their solutions are related and perhaps far simpler than it seems. While "waking up" is usually framed in a spiritual context, I would like to propose a scientific context for it. If the science in which I was trained, the science that gives all of us our basic understanding of the world we live in, has a great deal of responsibility for the trouble we are in, then it also has a huge and golden opportunity to unravel and help solve the problem. Therefore, I will envision a scenario in which science leads the way out of our global problems and helps unite us into the flourishing global community I believe is on Earth's evolutionary agenda for humanity:

Imagine that a global retreat of leading and leading-edge scientists is held for one "sabbatical" year on a Greek Island and named *The Second Socratic Symposium* in the recognition that our present time is one of extraordinary ferment and change, just as was the time of the first such symposium. The outcome of this symposium is a manifesto that officially changes the fundamental assumptions of the scientific worldview and its entire model of reality. This manifesto is put into popular language and broadcast throughout the world's media.

The world learns that scientists now recognize that all human experience occurs within consciousness and that we cannot therefore perceive any "objective" reality outside consciousness. Therefore, the model of a lifeless, mindless mechanical universe outside human experience had to be rejected as a false construct. The new model acknowledges that the only appropriate definition of reality is the sum total of direct human experience, perceived both as a world of "outer experience" including, but far from limited to, scientific experiment and as a world of "inner experience," perceived as thoughts, feelings, dreams, revelation or intuition. Taking inner experience as seriously as outer, science seeks information to inspire experiment from current religions and past cultures such as Vedic, Taoist, Kototama and indigenous traditions that have long experience in studying perceived inner worlds, thus building important bridges with spiritual traditions.

From this new perspective, science accepts consciousness as a fundamental assumption in its model of a reality in which everything perceivable self-organizes and creates itself. Because self-creation (*autopoiesis*) is the definition of life, the new scientific model is of a living, intelligent universe from a human perspective.

Physicists develop models of a self-creating universe in terms of living geometry. In a leading model, every point singularity in our universe is conceived as a spinning black/white hole of infinitely outward radiation perfectly balanced by gravitational contraction rotating infinitely inward, thus balancing entropy with centropy (or syntropy) and solving the outstanding unification problem in physics. All singularities, whether at the heart of a

particle, atom, cell, organism, planet, galaxy or the entire universe are essentially and fractally alike and their interacting wave fronts can be seen as creating each other as well as the field of zero-point energy from which they arise.

From a biological perspective, the new physics model shows a universal metabolism of anabolic buildup and catabolic breakdown from the fundamental vortex of a proto-galactic cloud in the macrocosm to the tiniest whirling particle in the microcosm, demonstrating that the entire universe at all its fractal levels is alive by the biological definition of life as *autopoiesis*, literally self-creation. Evolutionists recognize the Earth as a giant self-organizing living cell that continually recycles itself through tectonic plate activity and weather patterns. Earth gains ever greater complexity by evolving tiny cells on its surface through the intelligent alliance of DNA and proteins. These cells evolve enormous variety and complexity by exchanging their genomes as DNA becomes the planetary language of life, permitting blueprints to be encoded and shared among all Earth's creatures from the tiniest single-celled bacteria to the largest mammoths and redwoods.

With physics and biology reconciled in a common model, the other fields of science quickly integrate themselves, with alternative medicine becoming mainstreamed and psychology gaining a natural context of cosmic consciousness in which to see each individual consciousness as a unique perspective on knowing the whole through both inner and outer experience. Many conferences are organized to further integrate religious and scientific worldviews, while respecting their diversity and their individual evolution. A whole new branch of scientific investigation into the ongoing communion and conscious co-creation among all species and life forms develops, with special attention on indigenous knowledge in this field.

Perhaps most importantly, evolution biology goes beyond the Darwinian model of species evolution through competitive struggle in scarcity, recognizing that this is merely an immature level of development in which species compete aggressively to establish themselves before they learn to form cooperative alliances in which they feed and nurture each other to build complex stable ecosystems such as rainforests and prairies. The new model shows that Earth's greatest crises -- simultaneous extinctions of many life forms -- brought about her biggest waves of creativity, each extinction followed by a sudden explosion of new life forms. Not until things were thoroughly shaken up did these novel patterns arise, as the fossil record reveals.

All the symposium results leading to the new models had in fact already come out of research in physics, chemistry, biology, medicine and psychology over the past century, but the old model of a non-living universe had blinded most scientists to understanding their implications in a holistic context. Individual scientists had predicted the new model well before the symposium and were able to come together and catalyze this sea change for the whole edifice of science.

As soon as the new scientific model was publicized around the world, there was an enormous outburst of hope and joy. Humans had always known from experience that old rigidified structures do not change without shaking their very foundations. A butterfly cannot happen without the meltdown of a caterpillar and many cultural stories, such as the phoenix rising from the ashes, had recognized this fundamental pattern. Whole cultures had collapsed just

before new ones arose; countries destroyed in wars emerged in shiny new forms; philosophies and beliefs had been challenged and dissolved throughout history so new ones could take their place.

The new scientific story showed people that the same evolutionary process that had made hostile, competitive ancient bacteria evolve peaceful collaboration to produce huge new cells -- the kind all multi-celled creatures including humans are made of -- was the same process that was driving us to shift from competitive nations to global family. History made more sense now, with many thousands of years of competitive empire-building -- from kingdoms to nation states to multinational corporations -- newly understood as the juvenile to adolescent phase of humanity's evolution.

The new story of species maturation into peaceful cooperation was a powerful catalyst for billions of people who longed for a peaceful world. New projects for building global family through cooperative enterprises cropped up and flourished everywhere around the globe as the Internet wove them together. With science promoting a model of living systems embedded within one another, operating by the same principles at all size levels, it became easy to relate healthy families and communities to a healthy global economy in which every individual was supported in meeting their needs. Diversity became recognized as essential to creativity and humanity began moving into mature cooperation and mutual sustainability as quickly as possible.

Every Christian had already been taught to value service to others over wealth and status and to turn the other cheek when attacked. Muslims had been taught to do good to others and refrain from wrongdoing in daily life. The ancient Golden Rule of virtually all ancient cultures -- *Do unto others as you would have them do unto you* -- could suddenly be seen as the normal way of being for a mature species. The Dalai Lama had been telling us from his Buddhist perspective that multiple religions are an excellent way to meet the needs of diverse humans and that kindness is the universal spiritual practice they can all embrace. He had also had many conversations with the best scientists he could find all over the world and thus was prepared for the new scientific worldview when it was announced. Now it was clear at last that science and spirituality had been separated only for temporary historical reasons and had been brought back together by science itself!

All humans want to be loved, cherished, understood and cared for, so we *know* how to treat each other well, but the old scientific model had taught us that life had no meaning and was an individual struggle to take what we can get before it ends in nothingness. The new scientific model, like a gust of fresh air, had an impact as sudden and positive as the fall of the Berlin Wall, the demise of Soviet communism and the release of Nelson Mandela from prison, only vastly greater than all of them put together.

Nowhere was the wake-up call so dramatic as in the United States' government, which reconsidered its own constitution in light of the new scientific worldview and soon announced to the world that the serious flaws in its foreign policy had become apparent in the new framework and that it recognized now how unfortunately unresponsive it had been to ecological devastation and how insensitive to the real needs of the world's people it had been. The president made clear that from now on the US would do everything in its democratic power to be a role model global family member, beginning with unilateral

disarmament and the prompt conversion of all military bases to educational, health and conflict resolution centers. Many more women were urged to run for political office in recognition of the importance of their perspective and of gender balance. At the forefront domestic and foreign policy would be the real elimination of poverty everywhere. There would be full cooperation with the UN while peace corps and protective forces would replace the armed forces. The Earth Charter would be ratified and all other international treaties would be honored, while full support would be given to the World Court in the Hague.

Jubilation was instantaneous around the world and terrorists found themselves without support. The US was embraced and forgiven as a friend and big corporations almost tripped over one another in their race to become more sustainable and more accountable to people and planet. Cooperative ventures among religions mushroomed as never before. It was as though a hurricane had swept away an old world in deep trouble and freed the hearts and minds of people who eagerly embraced the new cosmic vision.

Is it possible? My faith in the conscious cosmos of which I am but the tiniest aspect brings me a resounding and joyful "Yes!" I know we are all a continuum of conscious energy like a keyboard from the slow waves of the physical through the electromagnetic spectrum all the way into the highest frequency waves of spirit, so I shall continue to play my whole keyboard with every blessed cell in my body and with my whole heart and mind until it is so. So be it!

My gratitude goes out to many colleagues in science, spirituality, economics, government, the arts and all fields of human endeavor, with special thanks to those whose work I alluded to specifically in this piece. In order of "appearance" they are Nassim Hameed, Milo Wolff, James Lovelock, Lynn Margulis, HH the Dalai Lama, Dietrich Fischer and Johann Galtung.

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