

WHAT SCIENCE CAN AND CANNOT OFFER TO A RELIGIOUS NARRATIVE

by Ursula W. Goodenough

Abstract. A molecular/cell biologist offers perspectives on the contributions that the scientific worldview might and might not make to religious thought. It is argued that two essential features of institutionalized religions—their historical context and their supernatural orientation—are not addressed by the sciences, nor can the sciences contribute to the art and ritual that elicit states of faith and transcendence. The sciences have, however, important stories (myths) to offer, stories that have the potential to unify us, to tell us what is sacred, what has meaning, and how we might best proceed.

Keywords: ancestor cult; earth cult; mystical experience; ritual; sky cult.

Scientists are trained to talk about what they understand. Most of us therefore avoid talking about religion. To move past this reluctance, I set about analyzing religious systems using the paradigm most familiar to me, the paradigm of biological evolution, asking how religions achieve reproductive success, what niches they fill, and so on. My goal was to develop a taxonomy of religious systems that would allow me to understand what they attempt to achieve. Only then, I reasoned, could I respond to the question of how science might or might not make a contribution. Out of this exercise has come a rather simple scheme, which I will set forth from the start.

The scheme makes use of the word *cult*, a word that connotes the mindless adulation of Elvis or Jim Jones. But in fact, the *Oxford English Dictionary* defines *cult* simply as “a particular form or system of religious worship, esp. in reference to its external rites and ceremonies.” This emphasis on exteriors is useful in that it allows us

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to put into the same category a variety of traditions that may have different origins and precepts.

The simple scheme, then, sees three types of religious systems: ancestor cults, sky cults, and earth cults.¹ We will consider each in turn.

ANCESTOR CULTS

As nearly as I can tell, all religious systems are in part ancestor cults. Reverence for ancestors takes specific expression, as in beliefs that the dead are actively engaged in bestowing benefits or harm, or it can be a very generalized concept, a concept of continuity, of preserving "the people of Israel," "the followers of Christ," and so on. An important spinoff of this orientation is the creation of religious community, of fellowship, the sense of shared tradition and purpose.

Ancestor cults create linkage with the past through the use of compelling art and ritual: totems are carved, chants are sung, the stories are read from the holy texts, and these become the metaphors for the ancestors themselves: the images and the ceremonies endow the ancestors with a reality that yields a sense of continuity. The art and ritual become the myth; in evolutionary terms, one would say that a cult with a compelling myth is high in fitness.

SKY CULTS

Sky cult refers to a myth associated with questions of origins and destiny: Where did I come from? Where will I go when I die? The destiny promised by a sky cult and an ancestor cult may be one and the same: When I die, I will join my ancestors in some happy hunting ground, in some nonterrestrial existence devoid of the trials of this life. But ancestor cults and sky cults usually diverge on the question of origins. In sky-cult myths about the beginning, there are usually supernatural creators with supernatural powers. In certain New Guinea traditions this creator is a crocodile; Greek/Roman mythos features a panoply of gods; and Judeo-Christian and Islamic traditions worship God with a capital *G*.

A key distinction among the various sky cults lies in the extent to which the creator is held to be actively involved in the daily affairs of the group. For Oceanic peoples, for example, the creator has negligible daily agency compared with the ancestors, who cause illness when behavior is inappropriate, and it is therefore the ancestors who are worshipped. In contrast, when the myth involves

a god who not only creates but also watches and judges, ceremonial attention is focused primarily on this god and his agents (prophets, saints, messiahs, monarchs).

The major present-day religious institutions are sky cults with myths that feature active, judging gods. The institutions serve to mediate access to these gods who are, by definition, otherwise remote and inaccessible. Since this mediation is performed by the likes of priests in the likes of ceremonial temples, institutional religions require financial support. The result has been a goods-for-services relationship which has had, in evolutionary terms, an important selective effect: the sky-cult institutions that have survived and now dominate the religious world are optimized for two traits, their compelling myths and their appealing rewards. I will return to the reward component later. Here we can ask, how do sky-cult myths become compelling? Several responses are particularly relevant.

First, sky-cult and ancestor-cult myths are often fused, generating stories of ancestral figures who have had direct interactions with the gods. When a person adopts such a religion, be it by birth or by conversion, these mythic ancestor/god relationships become the person's own story, and hence the sky becomes more immediate and accessible. If Moses or Jesus or Muhammad talked to God, then so might I.

Second, sky-cult myths are buttressed by some of the most wondrous art created by humankind. The mosques, the Kaddish, the saffron robes, the incense and candles, the hymns, the stained glass—not only do these reinforce the myth, but in many cases they serve to elicit transcendent states. Importantly, when these transcendent states are experienced, they are said to be the experience of God, of God within. Hence, there is continuous positive selection for myths that elicit transcendence since these experiences directly reinforce the validity of the myth.

The validity of the myth is, of course, the ultimate issue, and unquestionably the most important concept to be developed by sky cults is the concept of faith. The *OED* defines *faith* as: "Belief in the truths of religion, in the authenticity of divine revelation; the spiritual apprehension of the realities beyond the reach of sensible experience or logical proof." Not only does faith in the myth render it, by definition, believable; the state of faith provides a state of grace, a transcendent state that is profoundly meaningful and soothing to persons who achieve it. The acquisition of faith, therefore, can be highly adaptive, and its achievement is highly dependent on compelling sky-cult myths and their attendant art and ritual.

EARTH CULTS

An earth cult is most readily defined by the ceremonies it elicits: fertility rites, rain dances, celebrations of the harvest and the passage of the seasons. With closer scrutiny, however, many earth cults prove to be sky cults: to the extent that a rain dance is a petition to a supernatural god of the rains, then the ritual is in the service of a sky-cult myth. The dance becomes an earth-cult ritual when it is simply a celebration of the rains, for themselves, in and of themselves.

In the evolutionary lottery, earth cults have fared poorly. Worship of earthly things, earthly pleasures, graven images, the sensate—these are activities that sky cults have effectively pitted themselves against. The reason, I believe, is clear. If we now take up the question of reward, the reward offered by most sky cults is some sort of afterlife, reincarnation, immortality of the soul—some liberation from earthly things and from earth's most formidable certainty, the certainty of death. And while it is true that the reward of rain would be a compelling reward for the rain-dancer, the problem, of course, is that very often it still doesn't rain after many days of dancing. In contrast, the reward of an afterlife is not amenable to experimental test. It is a matter of faith. Therefore, to the extent that a sky cult can elicit faith states, it can offer reward.

A CULT FOR THE PRESENT DAY

So where has this analysis taken us? It allows us to recognize that ancestor cults and sky cults are remarkably adaptive components of our culture. They provide to billions of people a sense of ethnic and historic continuity. They provide the means to achieve states of faith, grace, and transcendence, states that offer stability and enrichment. They provide the largest share of all art forms, probably the only art that most people experience. And they provide answers, based on faith, as to why one is here and where one is going. To my mind, the worldview provided by science cannot make any contribution to these orientations, nor should it attempt to do so.

The problem with leaving matters in the hands of ancestor cults and sky cults lies not in what they do, but in what it is that they fail to do and, indeed, have traditionally made no attempt to do. First, I agree with Loyal Rue (Rue 1994) that, by definition, these cults tell particular stories, not everyone's story. Any attempt to change this situation would be the equivalent of trying to transform one species into another. Each is highly selected for its particular niche, and the diversity of cults is to be deeply treasured. But particular cults with

particular vocabularies don't get us very far in our search for a global myth.

Second, sky cults and ancestor cults leave global matters largely unaddressed. Morality, for example, is defined in terms of our behavior vis-à-vis one another, behavior ultimately dictated by the directives of the ancestors or the gods and their prophets. In contrast, our behavior vis-à-vis the earth itself is not part of the canon. Indeed, as we have noted, earthly matters are often regarded as negative testing grounds for the strengthening of one's faith.

If we look for examples of existing earth cults, they can be found in a number of contexts. Local practices of Roman Catholicism, for example, have often come to include features of "pagan" traditions, although these are usually co-opted syncretistically rather than becoming part of the official canon, and they often retain a sky-cult focus on supernatural agency. During the past few decades, moreover, as the environmental movement has become more robust, observances such as Earth Day have come to include such rituals as parades and pageants as well as workshops on solar energy and recycling, even though these activities are not usually spoken of as religion (perhaps because scientists are not the only ones who have difficulty with the term).

Most relevant perhaps are present-day movements that celebrate the earth in revivals of Native American traditions, earth goddess traditions, and related approaches that can be collectively, if imprecisely, called New Age. While I have not begun to explore these movements exhaustively, those that I have encountered offer a mystical rather than a cognitive approach to the earth. The earth is evoked as power, energy, magic, fertility, a source of transformation. There is much symbolic use of fire, air, and water, and rituals focus on lunar and seasonal cycles. But none of this is oriented within the present-day scientific worldview. Indeed, if anything, these movements express either an overt hostility toward science or else an indifference to its understandings.

Mystical experience is intensely meaningful, whether evoked by drumming and dancing in the moonlight or by Gregorian chants in cathedrals or by group meditation in Buddhist temples. It can also be elicited by such stimuli as string quartets or romantic love. For me, a religion works only if it offers the opportunity for mystical experience, but it needs to be more than mystical experience. It also needs to be embedded in my cognitive reality, and the New Age earth cults seem to be disinterested in this reality. Therefore, if we want an earth cult grounded in a scientific cosmology, we're going to have to invent one.

For me, the easiest way to orient myself in such an earth cult is to begin with the proposition, which may not be true but cannot as yet be disproved, that this planet is the only living planet, that there are no other life forms anywhere else in the universe, and that we humans are the only ones who understand the meaning of the word *meaning*. When I truly absorb this proposition, then I realize that I care about having life continue. Not my life, but life. I further realize that because of the way evolution has played itself out, humans are now the custodians of the planet. Were we to go extinct tomorrow, life would continue just fine without us. But we are here; we are, whether we like it or not, the dominant species; and we have unique capabilities to sustain life or destroy it. As I understand this, I realize that my participation in an earth cult is not an option but an obligation. As soon as there is caring, and an obligation to care, then we have the foundation of a moral system. The moral fabric of an earth cult is to care.

But what do we care about? How can we orient ourselves toward an earth that is so chaotic, so full of contradictions and tensions and impossibilities that we want to run back to the haven of our sky cults and abandon the whole enterprise? This is, I believe, where science can help.

When the term *science-religion dialogue* is used, *science* usually refers to one or both of the great scientific insights of our time, namely, our understanding of the physical nature of matter and the universe and our understanding that life has evolved. The dialogue then proceeds to consider whether the god(s) in fact created matter and life via such seemingly unusual means as orchestrating the Big Bang or directing gene mutation, or whether things happened some other way. These, we can now say, are sky-cult issues. A recent version of the dialogue is to be found in the *Time* magazine cover story (29 December 1992) entitled, "What Does Science Tell Us about God?" The answer, of course, is that science tells us nothing about God. Indeed, any sky cult can proclaim, and many have, that all of our understandings of the universe and of evolution have nothing to do with God: they are illusions, or they are irrelevant, or they somehow exist in addition to the Word. After hundreds of years of effort, in thousands of books written by thousands of theologians and physicists, the science/sky-cult dialogue remains a standoff, by definition. With faith as the wild card, nobody can define the rules.

In contrast, the sciences of the earth—biology, geology, anthropology, and psychology—have everything to say to an earth cult. Scientific inquiry is telling us, in increasingly wondrous detail, how life works, how enzymes catalyze reactions, how nerves transmit

impulses, how one cell divides into two, how continents drift about, how volcanoes erupt, what brains look like when they think. In the fields of biology that I study, there has occurred, during the past thirty years, such a breathtaking revolution in our understanding of how life works that those of us involved in the process of discovery are quite literally gasping with awe. In my experience, the awe feels the same as the awe I experience when I listen to a terrific performance of the St. Matthew Passion. Whether it is in fact the same brain state is beside the point. The point is that the beauty of molecular and cellular organization is a powerful complement to the beauty of rainfall and redwoods and owls. Life is beautiful all the way down. Unlike the physical universe, which for most people becomes increasingly bleak and terrifying the better it is known, the biological world yields an increasing sense of sacredness the better it is known. The more we know about life, the more we can care about it.

There is a subtle but important progression from *caring about* something to feeling *affection for* something. Affection requires direct knowledge, experience. A heterosexual may care about homosexual rights, but it is knowledge of, and affection for, particular homosexual friends that transforms the caring into morality. We can therefore say that the more we know about life, the deeper becomes our affection for it. Affection is that which binds together, and this is our definition of religion (Rue 1994).

THE SEARCH FOR A GLOBAL MYTH

A second powerful resource for a global religious myth is our emerging picture of molecular evolution. Sky-cult interpretations of evolutionary theory have picked up on the concept of improvement, of simple life forms giving way to more complex life forms, presumably as the consequence of some divine plan. But as we clone and sequence genes, we find numerous cases where the very same genes are present in bacteria and yeast and ferns and humans. Moreover, these genes direct the same cellular processes: at a molecular level, yeast cells grow and divide and send signals to one another in much the same way that humans do. We have long understood that we are dependent on other organisms in the sense that photosynthesis provides our oxygen and the food chain provides our nutrition. But now we are saying that organisms are interconnected, that our inter-relatedness goes all the way down. Evolutionary charts no longer depict trees that culminate in the crowning glory of humankind. Instead, they look like sunbursts, lines radiating out from central

foci, with the lineage leading to humans being no more significant than the lineage leading to mushrooms.

Our genetic relatedness has pivotal relevance to the moral fabric of an earth cult which, as we have developed it, is based on our capacity to care about life, to feel affection for it. Sociobiologists have given us the concept of kin selection as a calculus based on genetic relatedness: an organism is more likely to sacrifice its life for a sibling than for a cousin because it shares more genes with the former than with the latter. Our cognitive understanding of evolution now allows us to take this concept much further: to the extent that the genes are shared throughout all of life, this gives us a lot more to care about.

Our genetic relatedness also, of course, offers the potential for an ancestor-cult orientation within an earth cult. It is not our particular human or ethnic ancestry that concerns us or unites us, but rather our collective relationship to the first forms of life, those foci at the center of the sunbursts. As research continues to probe the origins of life, it becomes increasingly clear how improbable those origins are, how dependent they would have to have been on the particular conditions of the planet as it cooled and condensed. It is a noble story, quite as compelling as Genesis 1, quite as capable of orienting our existence.

The earth is inhabited not just by its mountains and streams, its algae and antelopes. It is also inhabited by human history, by our memes, our ancestor cults, and our sky cults. These are the creations of our brains, themselves wondrous collections of cells and molecules. Therefore, an earth cult celebrates not only geodiversity and biodiversity but also mythic diversity. To the extent that an earth cult makes no claim, has no need to supplant other systems of faith or tradition, it has the unique potential to create a collective global myth and hence to serve as a global religion.

So, the biological scientific worldview could certainly enrich the mythos of an earth cult. The real question, then, is whether the scientific worldview is in any way essential to an earth cult. Certainly earth cults have been forged in many cultures without an understanding of genes or molecules or plate tectonics. Does an earth cult *need* the earth sciences?

My answer is a most emphatic yes. A global earth cult is an appealing sort of concept in the abstract and can generate appealing notions that every species has an equal right to existence and that humans must return to their proper place in the ecosystem. But what *is* our proper place in the ecosystem? From an evolutionary perspective, what we are doing is precisely what we were selected for. We became the dominant species not by strength or speed or increased brood size

but because we used our brains to exert control, to exploit the ecosystem to our maximum advantage. We are not the only organisms so selected: a bacterial cell, placed in a vial of nutrient medium, will divide and consume and pollute until the medium is putrid and most of the cells are dead. Bacteria are kept in balance by their predators; our brains have devised strategies to eliminate our predators. So how is balance achieved? Do we allow the human pox virus to reenter its habitat? Do we allow rattlesnakes and grizzly bears to roam our suburbs? Or do we use these same brains to devise strategies for global equilibrium which, by definition, are no longer shaped by Darwinian principles? If so, who makes the rules? On what basis? Who owns the oil? How is population stabilized? Which population?

These are political decisions, politics in the end being the alternative to Darwinism. Religions have always provided the moral basis, the justifications, for political systems, and a global earth cult would aspire to no less. But it needs a text, a canon—the equivalent of the Bible or the Koran. The earth sciences could be such a text, a starting point for making such decisions, a basis preferable to the authority of custom. Such a canon would not dictate what choices are made—these would still have to be worked out by humans, on the basis of what is in the end deemed most fair and most feasible. But the scientific texts would help to identify what is fair and feasible, in a vocabulary that speaks of the entire biosphere and not just of a particular tradition. If scientists and nonscientists were to collectively take up the project of developing such a canon, it would be a most exciting enterprise indeed.

I close with a warning. While many *Zygon* readers may agree that the scientific worldview has much to offer a global religious myth, we are in a small minority. There is an antiscience orientation out there that can no longer be ignored. Science is seen to have created enormous problems and few solutions, and scientists are increasingly perceived as self-serving meddlers. While we can protest that this is a misunderstanding, that it is the application of science and not science itself that has created the problems, such protests miss the mark. What the scientists among us really need to be doing is to speak to nonscientists, at every opportunity, about the beauty of what we know, about the beauty of cells and molecules, indeed, about their mythic potential. When I first started doing this I felt completely ridiculous and not a little terrified: I had no data, no slides, no expertise. But it has become a part of my life. I guess it has become a part of my religion. To the extent that I've become an earth-cult evangelist, I feel like I'm earning my keep.

The Senegalese conservationist Baba Dioum can summarize: “In the end, we will conserve only what we love, we will love only what we understand, and we will understand only what we are taught.”

NOTE

1. Camille Paglia (1990) has developed this typology as well.

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