HUMANITY IN NATURE: CONSERVING YET CREATING

by Karl E. Peters

Abstract. Developing a scientifically grounded philosophy of cosmic evolution, and using the moral norm of completeness as dynamic harmony, this paper argues that humans are a part of nature in both its conserving and emergent aspects. Humans are both material and cultural, instinctual-emotional and rational, creatures and creators, and carriers of stability and change. To ignore any of the multifaceted aspects of humanity in relation to the rest of nature is to commit one of a number of fallacies that are grounded in a dualistic-conquest mentality. Examples of some new developments in philosophy and theology, metaphorical images, and ritual show how to overcome dualism in favor of a dynamic harmony of humanity within nature.

Keywords: cosmic evolution; dualism; humanity and nature; metaphor; ritual.

The purpose of this essay is to describe the relationship between humanity and the rest of nature in terms compatible with a modern Western view called "cosmic evolution."[1] Its primary thesis is that humanity is a part of nature in two respects. First, humanity is a part of nature in that it is constituted out of physical-chemical and biological heritages and it partly conserves these heritages, sharing them with much of the rest of nature on planet earth. Second, humanity is also a part of nature in that it reflects the creative side of nature, in which nature is always transcending itself, evolving into new, emergent forms. Humanity itself is in part a new emergent in that human culture represents the latest creative thrust of nature in our corner of the universe.

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Normatively, I will argue that for humanity to be properly related to the rest of nature, indeed for human beings to fulfill themselves, both aspects of humanity's relation to nature must be maintained in balance. My normative criterion is that of completeness. For humans to be fulfilled or perfected as humans, we need to maintain all aspects of ourselves in dynamic balance. I will formulate this balance in terms of four theses which suggest four ways in which the conservative yet creative dynamic of nature should be present in human beings. As I develop the four theses, I also will discuss what I call their respective fallacies—two fallacies for each of the theses. The fallacies are not to be taken as logical fallacies; I use the term *fallacy* polemically to indicate some trends in Western thought that tend to fragment human beings and to destroy humanity's relationship with the rest of nature.

In contrast to my normative position stands a dualistic thread in Western thought that considers mind in conflict with matter; hence humanity and its culture must conquer nature. Instead of dualism, I will suggest that humanity and the rest of nature must be yoked together in dynamic harmony, akin to that expressed by the ancient Chinese symbols of yang and yin in the Tao. Finally, I will suggest some resources in Western thought and practice that might facilitate a new understanding and way of seeing and will help motivate people to act more in harmony with the rest of nature.

Cosmic Evolution—Conserving yet Creating

The term *cosmic evolution* signifies a contemporary, scientifically grounded philosophy of the universe or nature as continually evolving. It includes physical chemical evolution, biological evolution, and human social or cultural evolution. It thus holds that human history is not divorced from but a part of the history of nature that began about 15 billion years ago. It leads to the realization that we are on the cutting edge, the frontier of the universe—a frontier not of space but of time. It has taken the universe or nature 15 billion years to reach this moment, 15 billion years of the transformation of energy into matter after the initial inflation called the "big bang." Fifteen billion years of the formation of galaxies, or the birth, life, and death of countless stars to create the atoms, other than hydrogen and helium, out of which the molecules that lead to life are made. It has take 5 billion years of earth history—of the formation of atoms into molecules, of molecules into more complex and finally self-replicating molecules (DNA and proteins), of DNA and proteins forming and reforming into a multitude of life forms. It has taken a few billion years of evolution of the nervous system from that of the simplest reptiles to that of humans. Our complex brains give us the capacity for using language to recreate the

universe conceptually, the capacity for empathizing with creatures other than ourselves so that we become concerned for the rest of nature, the capacity of foresight so that we think and worry about the future and plan to help evolve a world and a humanity better than the one we now know. Heirs to this long process of creative transformation, we stand on the forefront of time, created by nature evolving and with the opportunity to advance or diminish this magnificent creation.

The picture that I have just summarized indicates the creative side of nature. However, nature is also conservative. This can be exemplified in a number of ways. Let me give one. Evolving nature seems to use a "building-block" approach. More complex entities are formed out of simpler entities; yet the simpler entities remain intact so that complex forms can again break down into more elemental components. The simpler structures are not lost. Some photons of the "big bang," as the universe expands and cools, become subatomic particles, which in turn form protons and electrons, which become hydrogen and helium atoms. Yet some energy or radiation remains, and simple atoms can again be split, releasing energy: $E=mc^2$. In this way nature is conservative. Likewise, more complex molecules such as proteins can be analyzed into simpler molecules; cells are reconverted into molecules; even complex arrays of living cells, such as we humans, will again be transformed into simple elements and molecules as we return to the "dust of the earth." All this indicates that while nature continually creates more complex forms, the simpler forms out of which they are created retain their integrity. Nature is thus conservative as well as creative. According to the first law of thermodynamics, energy-matter is neither created nor destroyed; it is only continually transformed into other states of energy-matter.

Humanity in Nature

In developing the theme of humanity in nature I will be discussing four theses and their respective fallacies. The formulation of these theses and fallacies will be cast in terms of dichotomies that represent polar tensions in complex evolving systems. Each human being is a complex system developing over a lifetime, a system that can be analyzed or thought about in a number of ways—in terms of physics, chemistry, biology, psychology, sociology, politics, literature, and religion. Therefore, when I say in my four theses that humans are both material and cultural, both instinctual-emotional and rational, both creatures and creators, changing yet stable, I do not mean to imply with these dichotomies any ontological dualism. In fact, I am employing the dichotomies intentionally to overcome the kind of dualism that separates these facets of humanity and gives one side of the complex

human system priority over the others. Dualism results in what I call the fallacies, which fragment human beings and separate humans from the rest of nature.

Thesis A. Humans are both Material and Cultural. When I say that humans are material, I mean that we are composed of complex systems of organs that in turn are constituted by cells, which consist of molecules and atoms; our organs and cells acquire energy from food and are sustained by the oxygen in the air we breathe. In these ways we are part and parcel of the rest of nature; in fact we have nature in us. We thus conserve nature in our very bodies.

Yet our organs and cells are so constructed by our DNA recipes (themselves the products of evolving nature) that one part of our material being—our brains—allows us to be quite different from the rest of nature. Our brains have evolved, primarily in the development of the neocortex, to be able to create and use complex systems of symbols to represent the rest of nature and even ourselves to ourselves. With everyday languages and with more formal symbol systems such as mathematics, we are able to evolve a distinctly human culture including the arts, religion, and science. With such symbol systems we are able to communicate with each other and thereby create extensive social realities with common value systems—city- and nation-states and even world civilizations with their political, economic, and social systems. With such symbol systems representing the way nature works and with our imagination and tool-making and -using capacities, we are able to develop technologies that alter older natural systems. In this way humanity has transcended the rest of nature in the sense that it has created new kinds of realities called cultural-technological systems to overlay—and to some extent control and direct—the biological and physical-chemical systems.

Thus, on the one hand humanity is constituted out of an thereby conserves to some extent physical-chemical and biological systems. On the other hand, human culture and technology transcend the rest of nature and represent the creative thrust of nature itself. In both its conserving and creating aspects, humanity exists within the conserving yet creating universe portrayed by cosmic evolution.

If we overemphasize either the cultural or the material sides of our humanity we commit fallacies. When we ignore our material nature and focus on ourselves only as cultural beings we commit the *humanistic* and *technological* fallacies. We come to believe that only what we can create with our minds and with the tools developed by our minds is important.

Among some philosophers in the United States this attitude is called the "cowboy" or "frontier" ethic. According to this ethic we can ignore

the material side of things in ourselves and the rest of the world: our primary goal of life is to create human civilization and culture. This goal is expressed by the nineteenth-century American preacher Lyman Beecher. In his *A Plea for the West* Beecher writes about the civilizing of the frontier west of the Appalachian mountains:

> Such an extent of forest never fell before the arm of man in forty years, and gave place, as by enchantment to such an empire of cities, towns, and villages, and agriculture, and merchandise, and manufactures, and roads, and rapid navigation, and schools, and colleges, and libraries, and literary enterprise, with such a relative amount of religious influence, as has been produced by the spontaneous effort of the religious denominations of the West (Bedell, Sandon, and Wellborn 1982, 315).[2]

Such an attitude, exhibited by Beecher, sees culture as dominating and even replacing nature.

The problem with the frontier ethic mentality is that it can only be sustained if natural systems are infinite. They are not. Such a frontier or cowboy mentality, which severs culture from nature, commits the technological (humanistic) fallacy; it assumes that whatever we can do we ought to do. This inevitably leads to the destruction of other parts of nature and in the long run to the destruction of human culture itself, which in fact depends on the rest of nature for its existence.

On the other hand, if we elevate the material side of our humanity over the cultural, we commit the *primitivist* fallacy. Exemplified by many in the counter-culture movement in the United States in the 1960s, primitivism advocates a return to nature so that humans may live in harmony with the rest of nature. However, when this is carried to the extreme, human culture is ignored. In the effort to conserve nature, primitivists advocate a preindustrial, agrarian society. They deny the positive results of industrialization: the transformation of human social systems from being labor intensive to capital intensive, thus establishing the possibility of mass education for literacy and for creative achievements in the sciences and the arts.

Thesis B: Humans are both Instinctual-Emotional and Rational. I have already mentioned the development of the human neocortex, that part of the brain which makes possible language and culture. It is also the part of the brain with which we reason, that part which makes us, in Aristotle's terms, rational animals. However, we should not forget that in human beings the areas of the neocortex with which we reason are tied into evolutionarily older sections of the brain, parts of the brain that we share with other mammals and even with reptiles. With reptiles such as lizards we share a complex of cells in our brain stem called the R-complex. According to Paul MacLean, in humans the R-complex is the location of biologically and socially conditioned habitual kinds of

behavior. These R-complex "behaviors find expression in such human activities as the performance of daily routines and subroutines; adherence to fashions (both social and scientific); responding to partial representations whether alive or inanimate; repetitious, obsessive-compulsive acts; slavish conformance to old ways of doing things; obeisance to precedent as in legal and other matters; ceremonial reenactments; and all manner of deception" (MacLean 1982, 199).

Another section of our brain we have in common with other mammals. Surrounding the R-complex, the limbic system is composed of three subdivisions. The first is "concerned with activities insuring self-preservation—namely, feeding, fighting, and self-protection. The second subdivision has proved to be involved in primal sexual functions and sociosexual expression subserving procreation" (MacLean 1982, 202). The third subdivision, which has no rudimentary counterpart in the brains of reptiles and which progressively expands in higher primates reaching its greatest development in humans, is involved in primal sexual functions, maternal behavior, and play (MacLean 1982, 202). Humans thus share with other mammals (and to some extent even with reptiles) some brain structures, chemistry, and behavior. We are thus intimately related to and conserve in our own central nervous system some significant features of other evolved animals.

When we ignore these parts of the brain that are the seat of what we can call the instincts and emotions, we run the risk of committing the *rationalistic* fallacy in ethics. We develop ethical systems of rational principles that lack the power to motivate us to action. They speak to the "head" but not to the "heart." Hence, we find that we do not do the things we think rationally we ought to do, and we do those things we think we ought not to do.

Committing the rationalistic fallacy is one way of describing what has happened in contemporary Western moral philosophy since Immanuel Kant. At least since Kant, the discipline of ethics in both its deontological and utilitarian forms has been essentially an ethics of principles. While these methods of moral reasoning are in many ways sound, by themselves they fail to motivate people to action. Motivation to action depends on the activation of centers of the human brain in the limbic systems and even the R-complex. To activate these centers the right courses of action need to be symbolized by poetic metaphors, images, and rituals. Only then will the whole human person be involved. (I will illustrate the need for reason to be complemented by metaphors, images, and rituals in the concluding section of this essay.)

While moral philosophers commit the rationalistic fallacy by emphasizing reason to the exclusion of emotions and instincts, another part of Western society is so effectively manipulating the emotions and

instincts of humans that we often commit what I call the *emotionalist* fallacy. In many industrialized, free-market societies, the advertising of all kinds of products appeals to basic human emotions related to sex, food, and power, so that people mistake what they desire for what is desirable and convert wants into needs, luxuries into necessities. This is partly responsible for the emotional attachment many feel to a high material standard of living, which in turn continues the exploitation of the resources of the planet and the pollution of land, water, and air with all kinds of wastes. Only when we balance our emotions with reason, distinguishing between what is really desirable or good from what we desire, will we begin to seek new ways of living that are more in harmony with the rest of nature, that reconstruct the environment in ways that will permit future human generations to enjoy the benefits the rest of nature provides us today.

Thesis C: Humans are Creatures and Creators. The very fact that, according to the view of cosmic evolution, we are the products of a 15 billion year history is sufficient to establish the creatureliness of human beings. Cosmic evolution echoes the words of the Japanese Confucian philosopher Ekken Kaibara (1630-1714), who writes that all humans owe both their birth and continued sustenance not only to their biological parents, not only to society and its rulers, but ultimately to nature, to heaven and earth. "Not only do all men at the outset come into being because of nature's law of life, but from birth till the end of life they are kept in existence by the support of heaven and earth" (Kaibara 1958, 367). Humans are creatures, created and supported by the rest of evolving nature.

However, humans are also creators; Western theologians often say we are co-creators, along with the ultimate source of existence that brought us into being. In one sense all living things are creators as well as creatures; in them variations in the genetic or DNA code offer each plant and animal an opportunity to explore new possibilities for existence. Humans share in this biological creativity. Yet, more significantly in the history of the universe, we are creators in a new sense: our scientific culture and its technology allows mind or thought to control matter the way no other creature we know can.

How does technological life begin to control matter? It begins to control matter when it discovers the laws and develops the technology of nuclear fission. It begins to control matter when it substitutes the artificial, human selection of plants and animals for natural selection, or when it genetically engineers plants and domestic animals for increased food production and nutrition. Technological life begins to control matter when it unlocks the workings of the brain and the

human endocrine (or hormonal) system, and then creates "artificial" drugs or engineers diets to control malfunctions or to enhance wellness. Technological life begins to control matter when it develops the system of education that transmits the knowledge of these processes from one person to the next and also transmits the methods to increase that knowledge and to invent new technologies.

We should not underestimate the significance, from the point of view of cosmic evolution, of human technological culture's controlling matter. Astrophysicist Eric Chaisson sees this as the second great transformation in the 15 billion year history of the universe (Chaisson 1981, 297). The first was within a few billion years after the "big bang" when radiation became matter, starting the "matter era." Ever since matter "has dominated radiation... successively forming galaxies, stars, planets, and life." Now, on planet earth the second great transformation has taken place: with technology, human intelligence has begun to control matter.

However, there is one major qualification to humans as the creators of culture and controllers of matter. We are creators only insofar as we discover the laws that govern the operations of nature, including our own creaturely human nature—laws that we did not ourselves create but that were created in the prior processes of evolution.[3] As Kaibara might put it, even in our creating we are dependent on the overall controls of heaven and earth.

When we deny that we are creatures, even as we create, we commit what I call the *idealistic* fallacy. In Western society, with its complex cultural systems, there is the temptation to forget the requirements that an evolving nature lays down for all living systems. To illustrate let us consider the implications of ignoring the second law of thermodynamics and the carbon dioxide-oxygen cycle. According to the second law of thermodynamics, every system, living or technological, uses energy to maintain itself and in doing so radiates some waste energy or heat. That heat goes into the earth's atmosphere and ultimately out into space. Before it leaves the earth, however, some of it is trapped by gases such as carbon dioxide, which are given off from the interior of the earth through volcanic activity. Some gases are also produced in industrial processes. Technological culture adds more heat to the earth's atmosphere, and also more gases that trap heat, than agrarian societies. As the societies on the planet become more technological and industrial, they will add even more of these waste biproducts to the atmosphere.

Carbon dioxide is essential for plants, which convert it back into oxygen used by animals, including humans. However, when nations cut down their forests—major processors of carbon dioxide—more

carbon dioxide remains in the atmosphere to absorb more heat. This enhances what is called the Greenhouse effect: the planet will produce more heat than it can radiate out into space.

The changes are imperceptible in terms of the experience of the average human being; however, they are real and pose a major threat to humanity on earth. An increase of only a few degrees Celsius will melt the Antarctic icecap, raising the level of the oceans several meters, flooding coastal cities, many of which contain large human populations. Atmospheric water vapor will also increase, creating a swollen cloud cover that will trap even more heat, threatening to change the earth into a planet like Venus. As Chaisson points out, the combined exponential increase in energy consumption along with the Greenhouse effect yields the estimate that in one to two centuries "industrial production will have approached the level of threatening to barbecue life on Earth" (Chaisson 1981, 273).

Once we recognize the consequences of the idealistic fallacy, the danger is that we will commit the *apathetic* fallacy, that we will take the fatalistic attitude that we are only creatures who can change things for the worse and can do nothing to change things for the better. Our apathy is fueled not only by the storm of environmental crises we face but also by the fact that we have created political and social systems so complex that the average citizen and even societies' leaders begin to believe that we are simply cogs in huge bureaucratic machines. This cultural fatalism is expressed in the questioning attitude that wonders if we will be able to alter complex social structures and value systems quickly enough to head off environmental disasters while preserving and enhancing human freedom and dignity.

Yet, we cannot forget that we are not just creatures who can sit back and let "nature take its course." As the creators of such environmental problems as thermal pollution, we must take responsibility for our actions. One way to overcome apathy is to remember the slogan of environmentalists: "think globally, act locally." While we need global understanding, we cannot underestimate the importance of local actions that might effect major changes. In the past, major changes—the discovery of fire, the invention of the wheel, the discovery of gravity, the founding of religions—all probably began as local actions. Even the rest of the natural world acts locally in creating: mutations of DNA are local mutations in the germ cells of specific individuals; natural selection acts on the individual organisms carrying these mutations. While we cannot be sure that any particular action will have an ultimately beneficent outcome, we have some assurance based on the facts of cultural and biological history that the emergence of a new, global, humane, and environmentally sound planetary culture is possible as a result of some local actions.

Thesis D: Human Systems are Changing yet Stable. In the scientifically grounded philosophy of cosmic evolution, two fundamental features of the universe are change and stability. Physical, chemical, biological, and cultural systems are constantly evolving; yet they also contain long-term stabilities—the laws of nature which also include "well-winnowed" cultural traditions.

The environmentalist John Muir has written: "Nature is ever at work building and pulling down, creating and destroying, keeping everything whirling and flowing, allowing no rest but in rhythmical motion, chasing everything in endless song out of one beautiful form into another" (Danner 1973, 58). Yet there are stabilities or invariances in the universe that scientists in various fields discover as the laws of nature. A convincing philosophical case can be made that these invariances may not be eternal laws but may evolve into existence along with the structures and processes of which they are the laws (Schmitz-Moormann 1987, 444-49). If this is so, then the longest-term laws are those governing radiation and the elemental forms of matter—the laws of gravitation, electromagnetism, and atomic forces. Next, not quite as long term, are the laws of molecular chemistry, then the laws of metabolism and reproduction of living organisms, then psychological, economic, and social laws of human life and culture.

As more complex systems with their distinctive properties and processes arise out of simpler systems, the more complex systems still must obey the laws of the simpler systems. Living systems, for example, cannot exist in violation of the laws of chemistry or physics. Cultural systems, human societies, cannot exist in violation of the requirements of biology, because cultures exist and flourish only in symbiotic union with human nervous systems and nervous systems require support from other bodily functions (Burhoe 1981, 151-99). Yet at the same time, higher-order systems can control and govern the simpler systems out of which they are composed. For example, the DNA via RNA in cells serves as the steering or cybernetic mechanism by which the cell controls the processing of various molecules into proteins. Also, the value systems embedded in the religions of various cultures can serve as the governors, again in the cybernetic sense, of the use of material resources of the planet. The relationships between the stabilities, invariances, or laws at different levels of evolution are reciprocal.

Because the stabilities or so-called laws of nature, including human social systems, come into being with the evolution of that of which they are laws, it is a fallacy to consider as eternal any particular law, especially any particular cultural law. While the basic values of society should be understood as long-term cultural stabilities, as societies change some of their basic values may be reformed. Not to recognize

this is to commit the *traditionalist* fallacy. Such a fallacy is committed by fundamentalist religious movements, which mistake legitimate long-term cultural values expressed in beliefs and practices as true or valid for all time. When particular traditions—whether religious, political, or even scientific—are absolutized for all peoples for all times as fundamentals of "the faith," this fallacy can pose a grave threat to the contemporary, evolving, planetary community that some call the new "global village."

On the other hand, to ignore long-standing human traditions in order to adopt whatever is the most recent cultural belief or practice is to commit what I call the *creativity* fallacy. Making change itself absolute, thus forgetting physical, biological, and cultural laws, can lead to what Alvin Toffler in the late 1960s called "future shock" (Toffler 1970). Just as people moving to a foreign culture can experience the debilitating effects of culture shock, Toffler saw that an increasing rate of change could so radically and perpetually transform human society that people would constantly be in a state of future shock.

In terms of a scientifically based philosophy of cosmic evolution, I have been describing human beings as an integral part of conserving-yet-creating nature. Complex and multifaceted human systems may be described as being both material and cultural, both instinctual-emotional and rational, both creatures and creators, both changing and stable. Using the ethical criterion of completeness, I have also argued that not to affirm all these sides of humanity will be to commit one of several fallacies, which in turn have undesirable consequences for human living in relation to the rest of the natural world. Instead we need to affirm the norm of completeness, with various aspects of humanity in dynamic balance with each other. Such a norm can be represented by the ancient Chinese concept of yang and yin in dynamic harmony within the greater reality of the Tao.[4]

Dynamic Balance, not Conquest

In the United States, however, thinking in terms of such a dynamic harmony is made difficult because of a strand of Western thought that represents the dichotomies of human existence as being in fundamental conflict, so that one side of the dichotomy must be victorious over the other. Probably going back to the thinking of the ancient Iranian prophet Zoroaster, this kind of dualistic-conquest thinking combined with Platonic philosophy to shape an other-worldly form of Christianity. With the beginnings of colonialism and the rise of modern science and its technology there was added to Christianity's otherworldliness an emphasis on conquering and taming this world.

The American Puritans, for example, exhibited the dualistic-conquest mentality in encountering the American wilderness and the native Americans with what historian of religion Catherine Albanese calls millennial thinking. As a part of working toward establishing the beginnings of God's kingdom on earth, the Puritans sought to convert the Indians and conquer the wilderness in the name of Christian civilization (Albanese 1981, 328).

According to Albanese, millennial thinking has become pervasive in American culture because the traditions of Protestant Christianity have dominated the public life and thought of the United States. In the name of God and goodness one must conquer Satan and so-called evil empires. Such an attitude has been portrayed in literature, radio, movies, and television. The Western hero on a white horse rescues the innocent town; the war hero or espionage agent protects American secrets and hence American security from its enemies; in the latest millennial media presentation, Rambo rescues a buddy from the clutches of the evil empire.

The dualistic attitude of millennial conquest has come to dominate American sports. In contrast to the Olympics, the most popular American sports seem to have more in common with the Roman Gladiatorial games. The classic example is American football: in a colosseum-like stadium, two teams engage in physical combat in an attempt to conquer the other's turf and score by crossing the goal line. Physical combat, as part of the attitude of winning or conquering, is pervading other sports as well—ice hockey, baseball, basketball. A muted form of the millennial attitude has even become connected to the Olympic games as the numbers of gold, silver, and bronze medal winners are recited each evening on the radio and television news. The hope is that one's own country will win more medals than the others and thus prove itself once again to be number one in the world.

In terms of humanity's relation to the rest of nature, the contrast between this kind of dualistic-conquest mentality and the idea of completeness based on the dynamic harmony of perceived opposites is illustrated by the following story. A Taoist philosopher, commenting on the climbing of Mount Everest, said: "When you Westerners climb Mount Everest, you say 'We have conquered Mount Everest.' However, we would say 'You have befriended Mount Everest.'" A Taoist establishes a unity between humans and nature; all too often the dominant thinking in the West has been the conquest of nature.

If we are to reconstruct the relationships between human beings and the rest of the natural world, we must seek out ways of changing millennial, dualistic thinking. Especially, we have to alter conceptions, perceptions, and attitudes that portray the material side of nature—

either in us or in the rest of the universe—as something to be conquered and exploited only for the benefit of human culture.

Western Resources for Reconstruction

In spite of the strand of dualistic-conquest thinking in Western thought, there are many resources in the West, some traditional and some modern, that can be used for reconstructing a more harmonious relation between humans and the rest of evolving nature. Using my earlier discussion of human beings as both rational (neocortical) and instinctual-emotional (R-complex, limbic system) as a framework, I will review a few of these resources. First, I will look at some resources for changing our understandings. Then I will suggest some resources for changing our emotions and habitual forms of behavior.

Resources to Change Understandings. The primary Western resource I have been recommending to change our understanding of humanity in relation to nature is a scientifically grounded philosophical picture called cosmic evolution. Such a picture represents a creative innovation in Western culture. It is a new emergent in the evolution of the universe.

The picture of cosmic evolution can also be used to re-express some of the older understandings of the universe, its origins, and humanity's place in it. Long-standing cultural traditions represent one of the ways in which evolving nature is stable. Hence it is appropriate to see if traditional religious thinking can be united with the contemporary viewpoint of cosmic evolution. Not only is attempting integration of the old and new important from the standpoint of cosmic evolution; it is also important if we are going to capture the rational minds of human beings with this new understanding.

In the pages of *Zygon* a number of avenues are being explored for constructively relating Western religious thought to the scientific understandings of evolution. One is that of Ralph Wendell Burhoe, the founding editor of *Zygon*. Burhoe has spent much of his life developing a scientifically grounded theology.[5] While many contemporary theologians still think of God as a being who creates through evolutionary processes, at the core of Burhoe's thinking is a functional concept of God. God is not a being but a process: God does not create the universe; God is the process of creation. From this process perspective, Burhoe argues that God can be understood in scientific terms as the process of selection in the universe, whereby new variations are judged to be consistent with the underlying principles of the universe's operation (Burhoe 1972). At the physical-chemical level God is manifest as the laws or stabilities by which energy becomes matter, atoms become

molecules, and molecules become more complex molecules. At the biological level God becomes manifest as the evolving environment (in Teilhard de Chardin's terms the "divine milieu" [Teilhard 1960]). The evolving environment determines which new variations of DNA are or are not compatible with other life forms and with the laws of physics and chemistry. At the cultural level God becomes manifest as the requirements necessary for social cohesion and for the rational thought of human beings, who are also subject to the laws of matter and life. In short, God is the total reality system with all its subsystems of the evolving universe. God is the dynamic completeness of nature evolving. In relation to God so understood, humans will continue to evolve and prosper as long as they meet the already-evolved requirements of nature, even as they explore new creative possibilities for human welfare.

Resources to Change Emotions and Habitual Forms of Behavior. As I have indicated above, drawing on resources that revise our concepts, our rational thinking, is only part of what needs to be done to change people from the dualistic-conquest mentality to living more in harmony with the rest of nature. We also need resources that can guide human emotions and habitual forms of behavior in the limbic system and R-complex of our brains. Three resources will be mentioned: one gives us a new way of seeing ourselves as part of the earth; the second involves the development of metaphors to express this new way of seeing; the third contains some possibilities regarding ritualized behavior.

Perhaps the most significant advance leading to a new way of seeing humanity united with the earth is the space program. When astronauts took pictures of the earth, for the first time in history we were able to see ourselves as a single, unified planetary system. A graphic illustration of this new perception was given to me when I appeared a few years ago on a local television show to discuss *Zygon* and its contribution to environmental questions. On the show with me was Henry Swanson, the retired agricultural agent for Orange County, Florida. During our discussion Swanson unfolded a large picture of the earth taken on one of the astronaut missions. Written across the picture of the earth, in large bold letters, was the phrase: "LOVE YOUR MOTHER." Such images coupled with traditional metaphors such as "mother earth" can have a potent effect on the limbic system of the brain and our own motivations to care for our families.

Two other metaphors have come out of the space program and this new way of seeing the earth. These metaphors are cultural symbols that make sense rationally but also affect the limbic system, the emotional

centers of our brains. The first is of the earth as a "single organic system." Reminiscent of traditional metaphors—such as the "body of Christ" to represent the early Christian social system, or the Hindu metaphor of the "cosmic man" Parusha to portray diversity-in-unity of both society and the cosmos—the idea of the earth as a single organic system is a significant new way of seeing ourselves on our planet.

The second metaphor is "spaceship Earth." This technological metaphor suggests a new way of seeing that emphasizes the unity of the earth, the finitude of its resources, and the necessity of conducting economic activity and ethical decision making so as to ensure the sustainability of the environment for future generations (Birch and Cobb 1981, 239-40).

The development of a new way of seeing and its accompanying metaphors is only part of the process whereby the human motivational system might be changed. Metaphors are still partly conceptual; it is only when they become related to comparable behavior that they can become effective. Traditionally this behavior was in the form of rituals. The power of rituals and their symbols is seen today in ceremonies such as the lighting of the flame at the Olympic Games.

Rituals often reflect a "sacramental" understanding of nature and humanity's relation to it. In a sacramental understanding, material aspects of the world can become the vehicles for the spiritual, and the spiritual or mental can give meaning to the material. This is in sharp contrast to the dualistic understanding in which spirit and mind must control and overcome matter and body.

In traditional societies the sacramental understanding of nature was embodied in specific rituals. In Christianity the community that saw itself in terms of the organic metaphor of the body of Christ celebrated its unity with Christ in the eucharist. In ancient Hinduism, myths such as the sacrifice of the cosmic man Parusha in the creation of the world, had compatible rituals of sacrifice and re-creation (Noss 1980, 75-79).

Today new rituals need to be developed to express the ecological understanding of the value in nature and the ongoing conservative-creative process of nature evolving. The following example—a tea-composting ceremony reported by Albanese from the 1968 *Whole Earth Catalogue*—may at first seem quite mundane. However, so do the rituals of eating bread and wine or of lighting a fire—unless one sees such material acts as representing fundamental features of the universe and human life.[6] The ceremony was conducted by Gurney Norman with his composting class:

> The group began its session with tea, drunk quietly and ceremonially while sitting on cushions. Then the class moved on to an actual discussion in which practical techniques and questions were aired. Finally, at the end of the meet-

ing each person reverently sprinkled used tea leaves on the compost pile and took away a cup of half-finished compost and two worms. These items were seed for the compost pile that class members would later begin at home.

It was a small and humble liturgy that Norman and his class had followed, but nevertheless it was a definable ritual. . . . The acts were performed formally and self-consciously with a sense of their symbolic meaning. And clearly, they were related to belief and behavior systems held by class members. Here were people interested in the natural cycle of growth, destruction, and renewal. Here were people about to take up backyard composting on their own (Albanese 1981, 311).

In such a ceremony the rational understanding of natural, ecological renewal is combined with ritual actions that may help establish new behavior patterns in human beings. Certainly if such rituals were repeated regularly, they might help establish new stylized behaviors in the R-complex of human brains. These in turn might influence everyday behavior consistent with a scientifically grounded, rational understanding of the harmony between humans and the rest of nature.

I have argued that we human beings are, like the rest of evolving nature, both conservers and creators. We are creatures in many ways like other living creatures who have emerged out of matter. We also have emerged out of life, and with our cultural traditions and new creations we carry on the conservative yet creative work of nature—uniting matter and mind, emotions and reason, stability and change. In light of this picture of cosmic evolution, which some claim is divine reality, our task is to find ways of transforming with reason, symbols, and rituals the minds and hearts of humans around the world, so that they will not want to conquer one another or the rest of nature on our fragile planetary home. Instead they will come to love and care for one another and their parent, "Mother Earth." Thus we humans can find our own fulfillment, our own completeness within the dynamic yang-yin harmony of the Tao—within Nature Evolving.

NOTES

1. In this essay the word *nature* is equivalent to *universe*. I will speak of the universe as an evolving universe and also of nature evolving, meaning the same thing. Further, it will become clear that the universe or nature includes human culture and human technology.

2. The "West" for Beecher was that area of the United States west of the Appalachian mountain range, now called the Midwest.

3. Here I am following Karl Schmitz-Moormann, who argues effectively that the laws of the universe are not eternal but only come into existence when the structures of matter of which they are laws are created (Schmitz-Moormann 1987, 444-49).

4. It is also represented by the title of our journal—*Zygon: Journal of Religion and Science*. From classical Greek, the word *zygon* means to yoke together as a team. When combined with the yang-yin symbol, as on the cover of the journal, *zygon* symbolizes the uniting in dynamic harmony of the various facets of humanity of which I have been speaking.

5. For his work showing the compatibility between evolutionary theory and theology, and for his efforts in developing communities in which others could explore the relations

of science, values, and religion, in 1980 Burhoe was awarded the prestigious Templeton Prize for Progress in Religion.

6. The *Whole Earth Catalogue* began in the 1960s as a counter-cultural Sears and Roebuck catalogue. In its statement of purpose the catalogue declares that people are particles in a divine whole, which is symbolized by the picture of the earth on the cover.

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