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Surjit Singh Lecture

Can Religion Meet the Challenge of Human Evolution?

Robert N. Bellah

You might think from my title tonight, "Can Religion Meet the Challenge of Human Evolution?" that I will be talking about the culture wars, the militant atheist attack of people like Dawkins and Hitchens (whom Terry Eagleton neatly condenses into "Ditchkins") on religion in the name of evolution, but I'm not. I will be talking about something much more serious: whether religion can help us in dealing with evolutionary forces that can now easily push us over the brink into extinction by supporting other evolutionary forces that could lead to a more hopeful outcome. Following many others, I do not see evolution as a process of relentless determinism. From the earliest organisms, life has participated in its own evolution. How will we participate in ours?

Let me start with two powerful statements by two great scientists:

The most incomprehensible thing about the universe is that it is comprehensible.
—Albert Einstein

The more the universe seems comprehensible, the more it seems pointless.
—Steven Weinberg

Although my book on religion in human evolution contains twelve studies of particular societies, focusing on their religious beliefs and practices, I set my story in the framework of cosmological and biological history, what has come to be called big history, beginning 13.7 billion years ago with the Big Bang. Chapter 2 in my book, one of the longest chapters, gives an overview of that story of the development of the universe and of life on our planet. I chose that framework as it is the one most educated

people can agree on and take seriously, whatever other stories are important to them, and thus it provides a framework for a comparative study of religion. It is important to remember that that story is the achievement of science, and we must respect it as such. It is inevitable that that story will be given a meaning that cannot be derived from science, and we clearly have at present several conflicting versions of what that story means. I want to reflect on the conflicting versions by referring to my two epigraphs.

When Einstein said "The most incomprehensible thing about the universe is that it is comprehensible" he was saying something of the highest importance: we now know that the universe in which we live began 13.7 billion years ago, had a tumultuous cosmological history that led up to the formation of our earth 4.5 billion years ago and the beginning of life perhaps 3.8 billion years ago with the emergence of the prokaryotes, single celled organisms commonly called bacteria, that to this day are the most numerous forms of life in number of species and total biomass. From that beginning after a very long period of time there emerged complex single celled organisms called eukaryotes, with a nucleus containing the DNA that simply floated loosely in prokaryotes. We are eukaryotes since all multicellular organisms are formed of them but it took a long time to get to us: hominids are only a few million years old; Homo sapiens began to speciate perhaps 250,000 years ago, but modern humans with full cultural capabilities are only 150,000 years old or perhaps even younger. We are a very young species indeed.

What are we to make of this incomprehensible comprehensibility. At least two things: 1) The universe is unspeakably old and the physical and biological processes leading to us extraordinarily complex. 2) Beings who now begin to understand this whole amazing story, that is, us, are here. I would say that the Big Bang and the presence

of us are the two most important and equally remarkable things we can know from this story. Science gives us this story. What we make of it is no longer science, though for human beings making something of it is irresistible. I have spoken in chapter two of my book of cosmic optimists and cosmic pessimists. Both tell the same story but give it very different interpretations. I think we can learn from both of them but we must resist simple affirmations of either. Above all neither story can replace the many other stories that have arisen in the course of human evolution and that still have much to teach us.

Let me speak briefly of the cosmic optimist story. In my book I use Eric Chaisson's *Cosmic Evolution* as an example, but here let me turn to Thomas Berry who called his story "The New Story." Here is a summarizing paragraph from Berry's New Story:

> If the dynamics of the universe from the beginning shaped the course of the heavens, lighted the sun and formed the Earth, if this same dynamism brought forth the continents and seas and atmosphere, if it awakened life in the primordial cell and then brought into being the unnumbered variety of living beings, and finally brought us into being and guided us safely through the turbulent centuries, there is reason to believe that this same guiding process is precisely what has awakened in us our present understanding of ourselves and our relation to this stupendous process. Sensitized to such guidance from the very structure and functioning of the universe, we can have confidence in the future that awaits the human venture.

In this version, which is not science though it draws on science, "the dynamics of the universe" are doing quite a bit more than any scientist could affirm. Loosely speaking

such dynamics might be said to have "shaped," "lighted," and "brought forth," but I think no scientist as a scientist could possibly affirm that they "guided us safely through the turbulent centuries," remembering, among other things, that at the end of the last ice age the human species was reduced to as few as 10,000 individuals whose continuation was precarious indeed. Today we would classify such a species as "endangered." It is quite possible that we would have gone extinct then and would not be here today. Cosmological and biological evolution is marked by too many major catastrophes for us to be so confident that "the dynamics of the universe," read "Providence," were looking after us. Indeed the Christian idea of providence which lies behind such an assertion is itself too profoundly mysterious, affirming as it does that God's ways are not our ways, to allow us to be so confident even on that ground.

If we cannot say that the development of evolution that has ended up with us was necessary or inevitable, we cannot say either that it was just due to chance, though we can't rule that out. All we can truly say if we are in the realm of science is that evolution had the possibility of leading to us; after all, we are here, we must have been possible.

But many scientists of great stature believe that we are here by chance and agree with Steven Weinberg when he said, in his obvious revision of Einstein's remark about the comprehensibility of the universe:

> However all these problems may be resolved, and whichever cosmological model proves correct, there is not much comfort in any of this. It is almost irresistible for humans to believe that we have some special relation to the universe, that human life is not just a more-or-less farcical outcome of a chain of accidents reaching back to the first three minutes, but that we were somehow built

> in from the beginning. . . It is hard to realize that this [earth] is just a tiny part of an overwhelmingly hostile universe. It is even harder to realize that the present universe has evolved from an unspeakably unfamiliar early condition, and faces a future extinction of endless cold or intolerable heat. The more the universe seems comprehensible, the more it seems pointless.

Our good friend Richard Dawkins seconds Weinberg quite eloquently when he writes, "The universe we observe has precisely the properties we should expect if there is, at bottom, no design, no purpose, no evil and no good, nothing but blind pitiless indifference," And one of the great founders of molecular biology, Jacques Monod rounds out the picture with a vivid image:

> It is perfectly true that science attacks values. Not directly, since science is no judge of them, and *must* ignore them; but it subverts every one of the mythical or philosophical ontogenies upon which the animist tradition, from the Australian aborigines to the dialectical materialists, has based morality, values, duties, rights, prohibitions.
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> If he accepts this message in its full significance, man must at last wake out of his millenary dream and discover his total solitude, his fundamental isolation. He must realize that, like a gypsy, he lives on the boundary of an alien world; a world that is deaf to his music, and as indifferent to his hopes as it is to his sufferings or his crimes.

What I have tried to do in my second chapter is avoid either the cosmic optimist story in which we are "safely guided" to our present existence or the cosmic pessimist story in which the whole thing is utterly meaningless. It seems to me that the former

story, so far as it claims to be a scientific story, makes too much of the fact that we humans exist whereas the cosmic pessimist story doesn't take that fact seriously enough. I argue in my book that the fact that we are here is as important as the fact that the universe exists, and that, even staying within the world of science, it is undeniable that we are part of the universe and a very special part at that. Every sub-atomic particle in our bodies was created in the Big Bang. Every cell in our body is descended from those first forms of life, the bacteria, and our genes overlap those of the bacteria significantly to this day. That would seem to allow us with all humility to claim that we are at home in the universe because we are totally part of it. I cited Oliver Sachs and Marcus Aurelius for holding this modest view which does not go beyond the bounds of science in either a triumphalist or a nihilist direction. And we can say one thing more. We are the only part of the universe (as far as we know—there could be some others like us elsewhere) who know we are part of a universe 13.7 billion years old and the story of how we got from the big bang to us, though we have only known this story very recently, since the Big Bang and its approximate date were only discovered in 1927 and took some decades to be widely accepted. Still, however probable or accidental, the fact that we do know this is, to my mind, as important as the Big Bang itself.

Of course I would like to combat scientific nihilism and spend my time affirming, if not the scientific necessity, at least the scientific wonder of who we are. Language and culture is indisputably an evolutionary advance that counts among the great evolutionary transitions which are now widely accepted by biologists as having marked evolutionary history. But I'm afraid that I feel obligated to combat evolutionary triumphalism before returning not to optimism, for which I see few grounds, but hope which is a theological

virtue and comes from one of the many traditions that we still need in spite of the prestige of the scientific story.

A first point to remember before we get too confident about being "safely guided" to our present condition is that the history of the universe is full of extraordinary catastrophes. The Big Bang itself was an unimaginably gigantic explosion of such heat and speed that no life could have survived it, though, of course, life would only emerge billions of years later. The formation of stars and galaxies was no picnic either. Explosions of supernovas, very large, very hot, stars, though sometimes when they are beginning to age, can generate a tremendous amount of energy as they send their own particles out into space. The explosion of a supernova can be the source of solar systems and our own is sometimes supposed to have had just such a beginning. As planets begin to form from the detritus of the explosion the result is anything but quiet. The landscape of the early earth, if we can even call it a landscape, would be characterized by constantly falling matter, building up the bulk of our planet, and massive volcanic explosions as our planet formed a molten core. Things got quieter after a few hundred million years, but the earth on which life first appeared was nothing like what we see around us. Life appeared first in the oceans and the dry land was just rocks and volcanoes.

Stephen Jay Gould and Lynn Margulis, among other well-known biologists, have celebrated these first organisms to emerge from the nonorganic matter of which the early earth was composed in ways we are still far from understanding. These are the amazing bacteria, so wonderfully viable that they have survived and prospered beyond any other kind of organism. As Stephen Jay Gould has put it. bacteria are "the organisms that were in the beginning, are now, and probably ever shall be (until the sun runs out of fuel) the

dominant creatures on earth by any standard evolutionary criterion of biochemical diversity, range of habitats, resistance to extinction, and perhaps, even in biomass." Gould then goes on to say that "The tree of life is, effectively, a bacterial bush. Two of the three domains [bacteria and archaea] belong to prokaryotes alone, while the three kingdoms of multicellular eukaryotes (plants, animals, and fungi) appear as three twigs of the terminus of the third domain."

However we might want to celebrate the vertebrates, mammals, and primates that lead up to us, we must remember how much we owe the bacteria. (We might also remember how many of them are inside us. Our bodies consist of about a trillion cells, but they contain ten trillion bacteria, a very few of which can cause trouble but most of which are essential for our functioning.) Lynn Margulis has written, "The Age of Bacteria transformed the earth from a cratered moonlike terrain of volcanic glassy rocks into the fertile planet in which we make our home." They did this however by causing a tremendous catastrophe.

The early earth had an atmosphere of gases, some of which in large doses such as carbon dioxide would be poisonous to us, but only a tiny amount of oxygen, less than .00001 percent. However over two billion years ago one bacteria species, the ancestors of cyanobacteria, evolved a remarkable new form of making a living, what we call photosynthesis, by which they could use sunlight, water and carbon dioxide to create a superabundant supply of food, since there was virtually an endless supply of these ingredients. Cyanobacteria took advantage of their new discovery to spread rapidly through all the earth's oceans. The process by which they produced food from these ingredients involved splitting the water molecules to get the hydrogen from them but

releasing the oxygen molecules as waste. This caused a rapid rise in the percentage of oxygen in the atmosphere to something close to 21 percent as it is now, but in so doing wiped out a huge portion of the Earth's anaerobic inhabitants, that is organisms adapted to an atmosphere without oxygen, what was likely the largest extinction event in earth's history. Eventually, no later than a billion years ago, some oxygen producing cyanobacteria formed a symbiosis with single celled eubacteria called protists, producing the ancestor of many plants and algae. So we have the oxygen producing cyanobacteria to thank for all the products of photosynthesis on which we and all metazoa, that is animals, depend for food.

Lynn Margulis goes so far as to say we and our animal friends are parasites on the cyanobacteria in that we cannot produce our own food and are wholly dependent on them to do it for us. To put it simply, if all the cyanobacteria were to die, we would soon be dead, for as soon as the existing animals and plants we eat were consumed there would be nothing left for us to eat. On the other hand, if we ceased to exist, the bacteria in the world would hardly bat an eye, if they had one, for they could survive our total demise unscathed. As I tried to signal at various points in my book, though we may, not unjustly, think of ourselves as at some kind of pinnacle in evolutionary history, we are there quite precariously and owe a great deal to creatures, including the very simplest, upon which we completely depend. I could develop the theme by discussing the largest group of multicellular organisms, the insects, who, unlike bacteria, do have amazingly complex brains for such small creatures, as well as the capacity to see and smell, and who provide us with a variety of services without which, also, it is doubtful that we could survive. Nor can we say that culture gives us a freedom absent in all other organisms.

Without denying that our capacities for reflective consciousness have reached levels unknown to other species we would be wrong to think that those "lesser" species are subject to ruthless determinism, are completely preprogrammed by genes and instincts and are therefore qualitatively different from us. Everything alive is sentient, can learn in the face of new conditions, and participates actively in its own evolution. All life is creative—we have no monopoly on that.

The down side of this story is that, with all our amazing achievements, we are remarkably fragile. We are, as I show in my book, megafauna, that is, very large organisms, with a very high energy need, and it is especially our brains that need so many calories. Like all higher mammals we are vulnerable to the second law of thermodynamics far more than simpler organisms are, that is the more complex, the harder to manage and the easier to fall apart.

But when you add culture, especially modern culture, our vulnerability becomes truly alarming. I have put in my book a great many warnings, subtle or not so subtle to that effect. I have been challenged by some commentators on my book to say more about adaptation and maladaptation, the common currency of natural selection. So let me go beyond the numerous hints in my book to discuss explicitly some concerns about natural selection when it comes to humans. One of the measures of adaptation is increase in offspring: to put it simply, the more you reproduce the more you succeed in what Darwin called "the struggle for existence." Let us look for a moment at some interesting facts about human population: at the beginning of the Common Era there were, it is estimated, about 250 million humans on this earth. It was not until 1500 that that population doubled to 500 million. To double in 1,500 years looks pretty good taking present

concerns into account. However from 1500 to 1800 population doubled again to reach one billion. Doubling in 300 years is a lot faster than doubling in 1500 years, but what is interesting is that it had nothing to do with modernization or industrialization which didn't exist in 1800. This increase was almost wholly due to what is called the Atlantic exchange, that is, the many new plants that the European discoverers of what was to them a New World brought back to Eurasia. The most important of these were potatoes and corn, not only high in calories, but they will grow in soil where wheat and rice cannot grow, thus increasing output without decreasing the native staples.

But after 1800 something remarkable begins to happen which is clearly related to modernization and industrialization: population doubles again between 1800 and 1927, faster than ever but still slow in terms of what was coming. I was born in 1927 when the world's population reached two billion. Last October, when I was 84, the world's population reached seven billion. That is, it grew three and a half times in my lifetime, and if I live even a few more years I could see it reach eight billion and so quadruple in my lifetime. How marvelous! How adaptive! What an achievement we have made in out-producing any possible rivals for our primacy! Or is it? Most scientists in the world today believe that this enormously rapid increase in population and the geometric increase in the use of energy that made it possible are signs of profound vulnerability, that we have already crossed the line of sustainability where the costs are outrunning the benefits. Rather than shouting Hurray, they see giant red lights flashing and sirens going off. What worries them is not that geometrically rapid population growth is "against evolution." It is explained perfectly by evolution; it's just that evolution itself is very complicated and simple contrasts between what is adaptive and what is maladaptive are

not always helpful. Evolution goes on at many levels; unless we keep the levels in mind we will not understand either the achievements or the dangers.

Remember that 99.9 percent of all species have gone extinct and that it is the simpler ones that have survived the longest. It is hardly possible to argue that extinction is "against evolution" since extinction is such a huge part of evolutionary history. But however natural extinction is, how can we humans affirm cosmic optimism when our species seems on the verge of creating not only its own extinction but the extinction of a great many of the larger multicellular organisms as well? The bacteria will probably do fine, as Stephen J. Gould has noted, and even in a couple of billion more years they may give rise to another try at the evolution of large scale creatures. That can hardly reassure the cosmic optimists. In short there is nothing in the history of evolution that can assure us that we will inevitably survive and prosper, given what we have done to the earth in the last two hundred years. If we look to the scientists to reassure us we will find them shaking their heads, furious with what is going on and our unwillingness to do anything about it.

Having, I hope, shown that cosmic optimism in unwarranted, let me say just a word against cosmic pessimism. I want to contest especially Jacques Monod's assertion that man must wake up to "discover his total solitude, his fundamental isolation." Of course Monod is arguing that it is as the only reflectively conscious species that we know of that we are alone. And I have agreed to the extent that I have said that the second most important thing about the universe after the Big Bang itself is that we know about it and everything since. Yet besides the point I made early on that everything in our bodies comes from the subatomic particles in the Big Bang and descends from the unicellular

organisms that arose billions of years ago, we did not gain our cultural consciousness all of a sudden out of nothing. We can argue that primitive consciousness, what some biologists call sentience, and purposive action, are coterminous with life itself, even long before there were animals that had developed brains. And we now know that insects, far from being totally programmed, have the most amazingly complex brains, based on marvelous nano-technology, that allow them to decide many things for themselves. As so often Darwin himself had an inkling of this when in the *Origin of* Species he said of insects where the power of instinct seemed almost total, "A little dose, as Pierre Huber expresses it, of judgment or reason, often comes into play, even in animals very low in the scale of nature." (*Origin*, 208)

And, we have learned rather recently, that among some mammals and birds that practice parental care of helpless offspring, there have emerged the capacity for empathy, even cross species empathy, as well as ethics and politics. Thus it turns out that our extraordinary capacities of cultural consciousness arose and could only have arisen from billions of years of the evolution of consciousness. We express the consciousness of life, the consciousness of the universe, of which we are part and from which we have come, and it is the product of an extreme modern ideology of individualism that would see us as solitary and isolated.

But just because we have arisen from the whole process of the evolution of life we are still subject to the pressures of evolution which go on apace as much as ever in the realm of culture and consciousness itself. We are, as is all life, subject to natural selection before which we are not supine, but in which we, like all life, but with special powers that are both our strength and our weakness, participate and have an influence on

our own evolution. Language is an all-purpose technology that is the greatest technological advance in human history, far greater than the computer, which obviously would never have arisen without it. It allows us to do amazing things, including suicidal things. Derek Bickerton, the evolutionary linguist, has remarked that perhaps the reason that we have not seen any sign of conscious life as we search the universe for signals is that when any complex organism discovered language on some far away planet it rapidly went extinct.

We tend to think of natural selection as "the struggle for existence," the term Darwin himself used in the second chapter of *Origin of Species*, or even the term "survival of the fittest," which Darwin after long hesitation, adopted from Herbert Spencer. We see two male lions fighting it out on the savannah to see which will propagate more offspring than the other and therefore contribute to a stronger line; or we see two species struggling over the same territory to see which will replace the other. There is truth in both these images, though not the whole truth. We need to see selection going on simultaneously at several levels and we also now have to add, what Darwin saw only glancingly, that cooperation is also an indispensable element in natural selection so that struggle is never the whole story.

Stephen Jay Gould has pointed out that natural selection goes on at many levels. We think of it as taking place above all at the level of individuals, by which we mean organisms, but Gould says that individuals exist at every level, that the level down from them is their parts and the level above them is the society of which they are members. Thus genes are individuals and selection can go on at that level, though not as exclusively as Dawkins argued in *The Selfish Gene*. Cells are individuals, as are, of course,

organisms, though a large class of organisms is single celled. Organisms consist of cells and combine in many kinds of societies. But societies are also individuals and there really is such a thing as group selection as Darwin himself believed when he argued that groups that had more altruists could "defeat" groups that had fewer. This was long denied in twentieth century biology which focused on organismic selection alone. But not only groups but species can be individuals—they can certainly arise and can become extinct. Perhaps we could go beyond Gould and say that the biosphere is also an individual that can succeed or fail.

What has become a triumph of recent biology is the return to respectability of group selection. Groups that cooperate, that are not riven with inner division, such as, among humans, extreme income polarization, do better than groups that lack such cooperation. The bad news is that it is external threat that creates the strongest group cooperation and solidarity, and war is a wonderful means of creating strong groups. Thus Frans de Waal, the great primatologist reminds us that external threat creates solidarity even among animals:

> Not surprisingly, given this integrative function, formalized hierarchies are best developed in the most cooperative species. The harmony demonstrated to the outside world by a howling pack of wolves or a hooting and drumming community of chimpanzees is predicated on rank differentiation within. Wolves rely on each other during the hunt, and chimpanzees (at least the males, who are by far the most hierarchical sex) count on the other members for defense against hostile neighbors.

Human societies are seldom so united as in time of war. In spite of Stephen Pinker's argument that violence, even war, has declined over time, war remains an enormous threat, not least the threat of war between the two most powerful nations on earth: the United States and China.

To bring all this biology back home and to the history we are now making, we are now in the midst of intense natural selection pressures: human species against all other species for scarce resources as shown by our incredible population growth, intra-species conflict brought on by nationalism and the struggle for dominance between nations, and just such intense group selection as nationalism illustrates helps us understand the weakness of our species solidarity, of cooperation in the fight against global warming as indicated in the failure of Kyoto and Copenhagen, and the unwillingness to think of the common good within the most powerful nations as each individual is encouraged to get the maximum and the devil take the hindmost.

A little parable here: We are multicellular animals: each of us is made up of about a trillion cells. All these cells are descended from single celled organisms. They have been differentiated by master cells to become muscle cells, nerve cells, blood cells, etc., but each of them has a little impulse, shall we say, to return to its past and make it on its own, that is, not to do the job it was differentiated to do, but to multiply as many replicas as possible so as to displace and triumph over the other cells in its vicinity. Multicellular animals have evolved control mechanisms for getting rid of such self-seekers, but they are not always effective and become weaker as we get older. No complex system can continue to exist without centralized control and management mechanisms. What do we call such cells who decide to go it alone and replicate for the

good of themselves and not the common body? We call them cancer. Lynn Margulis argues that cancer is not a disease, it is a regression, that is, a regression to an early stage when each cell was on its own. Cancer can be enormously successful at first, but unless checked it will kill its own multicellular body and so itself. If you read the obituaries in the Chronicle, as at my age I am often tempted to do, you will see very many who died "after a battle with cancer" as it is commonly put. Cancer is suicidal. So is nationalism. So is radical individualism.

What we need now is not just national solidarity, but species solidarity, and since we are so dependent on other species, not a selfish species solidarity but one that goes on to embrace the solidarity of the entire biosphere. Should we fail in that, should we bring down our own species and inevitably a lot of others with us, though not the bacteria, we would be committing social suicide, national suicide, species suicide, all of which are natural evolutionary processes. If we could muster the intelligence and the solidarity to choose global cooperation instead of global suicide, that too would be because of natural evolutionary processes. Many scientists and science writers are telling us what we are doing. Elizabeth Kolbert, for one, a prize winning author on climate change, has commented, "It may seem impossible to imagine a technologically advanced society could choose, in essence, to destroy itself, but that is what we are now in the process of doing." (Heintzman, p. 157)

With the help of a marvelous new book, Ralph Heintzman's *Rediscovering Reverence* (*Rediscovering Reverence: The Meaning of Faith in a Secular World*, McGill-Queens University Press, 2011), let me try to describe the cultural forces that seem to be pushing us in this direction. Looking at the long-term modern project, Heintzman sees

the rise of self-assertion as a set of virtues that have helped us throw off the dependence and submission of earlier ages when all except a few had to deny their own selves for the sake of social survival. In undertaking this task, which turned out to be in many ways liberating and creative, moderns have tended, as Heintzman puts it, to deny the equally if not more important virtues of, as he puts it, reverence. His way of putting it is an improvement on, but related to what I described in the Conclusion of *Habits of the Heart* as the conflict in modernity between "the culture of separation," by which I meant the culture of radical individualism, and "the culture of coherence," by which I meant the culture of the common good. Let me quote from him extensively as he gives a marvelously balanced picture as to why both these tendencies are essential to human beings, though one of them has to have priority if we are to make it at all:

> The danger of "one-sidedness" gives us yet another reason to revisit Hegel's formula that "life is the union of union and non-union." The extreme case of global warming helps us to see another dimension of what he was getting at. The virtues of reverence are the virtues of "union": the habits of human feeling and behaviour associated with a deep awareness of the unity and connectedness of all things. The virtues of self-assertion are the virtues of "non-union": the habits of feeling and behaviour associated with the impulse to freedom, expansion, and self-development. Both are necessary to life, even to biological life, and especially to human life. But only the impulse to union, by definition, can provide a ground to link and nurture them both. That's why, both logically and in reality—in our real lives, even if we no longer have eyes to see it or the words to express it—the virtues of reverence must take priority over the

> virtues of self-assertion; why they must come first. Because they establish the frame. Self-assertion can only take place within a larger frame. Without that larger frame—without, at the extreme limit, a habitable world—they both die. But without the virtues of self-assertion, we do not have anything worthy to be called life. Without both sides of the human paradox, it would not be a human world. (Heintzman, p. 169)

I have said nothing about religion all this time. Heintzman has a lot to say about it and I have recently published a very large book about it. But here let me just close briefly: religion provides enormous resources for the move to global solidarity and peaceful coexistence within the biosphere, better ideas for that than any other sphere. Where else will you find such statements as that all human beings are "created in the image and likeness of God," as the Bible puts it, or "all within the four seas are brothers" and sisters as Confucius put it? Yet religion can also lead to suicidal conflict within and between the great traditions. An American candidate for president said recently that Satan was particularly concerned with attacking the United States because we are the only good nation on earth. We can see both things going on at the moment. Evolution is to some extent in our own hands. What will we choose to do?