A SCIENTIST AND A THEOLOGIAN SEE THE WORLD: COMPROMISE OR SYNTHESIS?

by Mary Gerhart and Allan Melvin Russell

Abstract. A scientist (for whom the world is the universe) and a theologian (for whom the world is planet Earth) engage in dialogue, not contrived Platonic or Galilean dialogue, but true bidisciplinary dialogue that strives for higher viewpoint. S: Is the preservation of the human species a primary human responsibility? T: It may be a responsibility we share with God. S: The human species has a limited future if confined to the planet Earth. We must diversify our habitat by colonizing space. T: We are responsible for other life on the planet as well. The discussants conclude that besides protecting Earth ecologies, we should create new ecologies in space.

Keywords: bidisplinary; colonies in space; dialogue; environment; future; God; higher viewpoint; panentheism; worldview.

MG: Allan as a physicist and I as theologian are about to engage in a bidisciplinary dialogue in which we explore and attempt to integrate our two views of the world. This Templeton Symposium encourages us to express both our individual and professional views, and Allan and I will be doing that in the spirit of Sir John Templeton's statement that "We are here for the future."

AMR: By dialogue we don't mean something like either the Platonic dialogues or the dialogue one finds in Galileo Galilei's last book, *Dialogues Concerning Two New Sciences* ([1638] 1914). Both Plato and Galileo created "fall guys"—shills for the opposing point of view. In those dialogues, one speaker is clearly intended to be knowledgeable or right and the others naive or wrong.

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MG: In contrast with those dialogues, we presume in ours that each of us has something to contribute in an effort to reach a higher viewpoint . . .

AMR: . . . and that we have a chance of reaching a higher viewpoint if we don't demolish each other in the process.

MG: It is true that these discussions often don't go smoothly.

Our use of the term *higher viewpoint* is similar to Bernard Lonergan's conception of a higher viewpoint as he describes it in his book, *Insight: A Study of Human Understanding* (1957). There *higher viewpoint* refers to the succession of insights that occur in different contexts as human beings face up to and respond to ever more complex demands on their capacities to know.

Lonergan gives as an example the development of algebra after the operations of arithmetic became insufficient to answer questions about quantification and measurement. Lonergan's description of a *lower* viewpoint in successive situations is also apt. He said, "timely and fruitful ideas are disregarded," and the nonimplementation of these ideas deprives subsequent stages "both of the further ideas, to which they give rise, and of the correction that they and their retinue would bring to the ideas that are implemented" (1957, 229).

AMR: We'll have more to say about higher viewpoint and bidisciplinary method after attempting integration of our views in this dialogue. Science and theology have developed into disparate disciplines in contemporary culture. For now, just bear in mind that each of us is speaking from a different perspective and that each sees the world in a different way.

MG: In *Metaphoric Process: The Creation of Scientific and Religious Understanding* (1984), we explored the senses in which, epistemologically, scientists and theologians have much in common. There we argued that, as knowers, the scientist and the theologian function in much the same ways. But views of the *objects* of scientific and theological inquiry are likely to differ more than do acts of knowing in the two disciplines.

AMR: In earlier work, we tried to develop a common view of the objects of scientific and theological inquiry by including them all under a generalized conception of text (but see Gerhart and Russell 1987). The approach we take today moves toward a synthesis of the two views that does not require a common view.

THE DIALOGUE

MG: During our flight to Chicago, you said your view of the world, a scientist's view, was like the view pictured on the cover of the symposium brochure—the view of Earth from space. As a theologian *world* is more apt to mean for me what it does in Andrew Marvell's "Had we but world enough and time."[1]

I want to distinguish between theological views and general religious views. Both a religious scholar's and a theologian's view of the world are highly phenomenological and take multiple aspects of religious experience as their general focus. Religious experience has to do with freedom, authenticity, and ultimacy. Theological reflection has to do with all that comes to the attention in the light of religious experience. For theologians, this totality of experience is related to the experience of God. For some theologians, this totality *is* the experience of God; for others, the world itself becomes sacred. This explicit attempt to understand the whole as it ought to be is what makes theology a normative discipline. Second, for a theologian, the world is the place of being. The German philosopher Martin Heidegger called the phenomenon of being human *Dasein,* or "being in the world." It wouldn't be far off the mark to say that, for a theologian, the world is where human beings are.

AMR: I'm speaking, then, with the right kind of scholar. Since I want to raise a question about the relationship between God and the human species I should talk with a theologian. The issues we are concerned with are issues of science and theology more than they are science and religion. So is world for a theologian the entire cosmos as experienced, say, by a cosmologist or is it planet Earth?

MG: Earth. I really mean *terra firma*—world for a theologian is the place where human beings are. Therefore, environmental issues, for example, are likely to be close to the sensitivities of a theologian. If one of the perennial religious senses is that of wonder at one's own being in the world, another is a passion that *other* human beings have the wherewith to sustain the same sense of wonder. In sum, the theological view of the world is inveterately anthropocentric in the sense that it is responsive to human needs and claims. It is theocentric in the sense that it takes seriously the question of god or goddess as the ultimate object of human experience.

AMR: But it seems to me that describing the theologian's view of the world as theocentric can be understood in two different ways: It can mean either that the theologian sees the world from God's point of view or that the theologian understands the world to have God at

its center. In science, it is more common to use the word anthropocentric, or geocentric, or heliocentric to distinguish the nature of the theoretical model that is being called up. I have no trouble with your saying that a theologian's view of the world is theocentric if you mean that the theory of the world has God at its center. However, if you mean that you see the world from where God is or that you understand the world as God understands the world, I would have trouble using the adjective theocentric.

MG: Theology has always been careful not to claim God's view. The mysterious God, the incomprehensible God—these all implicitly disclaim being able to see the world from where God is. On the other hand, the view that God/ess is the center of the universe has been a long-standing metaphor. The psalmist, for example, proclaims that all creation glorifies God and that human beings give a voice to this central magnification of the sacred. Now let's have the physicist's view of the world.

AMR: You're right about the physicist's use of *world* tending to mean the planet Earth as viewed from space. That would hold even for, say, a geologist who might nonetheless go along with *terra firma.* However, physicists view Earth in an astronomical context as a planetary body rotating and revolving around a rather common type G2 star, one of perhaps 400 billion stars in our medium-sized Milky Way Galaxy. The garden-variety nature of our star has prompted some scientists to propose that solar systems like ours are also commonplace and that a significant fraction of them include a planet like ours—suitable for life. This kind of thinking has inspired SETI, the Search for Extraterrestrial Intelligence. While I don't object to scientists listening for signals from outer space, I am not myself a proponent of SETI. I think the existence of another planet like ours is far less likely than the SETI people do. Bear in mind that we have an incomplete understanding of the origin of our solar system, so we are on shaky ground when we say that significant numbers of other planetary systems exist. If we are concerned about the continuation of intelligent life in the universe, prudence would call for us to assume that we are alone. Is the continuation of intelligent life in the universe a theological issue?

MG: The question of the continuation of intelligent life in the universe becomes a theological issue when the continuation of intelligent life is related to the question of God: the biblical God of creation is understood to have existed prior to human life. In the biblical understanding of God, there is no reason to expect that the continua-

tion of human life is necessary to the continued existence of God. But that's not the current understanding of God. So it's possible that God as now conceived is necessarily linked to human existence, and one could ask whether God as now understood would exist in the future if there were no longer intelligent life in the universe. That human beings are necessary to the existence of God or at least assumed in the question might be argued by theologians who hold the panentheistic view.

AMR: Interest in the God of creation has been rekindled by the new understandings of the origins of the universe that cosmologists have developed over the past twenty-five years. The religious dimension of these understandings has been inscribed in what is called the anthropic principle—the apparent fine-tuning of the universe so that its laws and structure appear to be critically adjusted to make human life possible. Some physicists and theologians have seen in the anthropic principle evidence for the existence of a God of creation. I am myself more interested in the questions the principle might be understood to raise about the works and intentions of human beings toward the cosmos and the importance of intelligent life in the universe to a contemporary understanding of God. If the universe was created the way it is in order to make the evolution of human life possible, then it seems to me we can infer that the continuation of the human species in the cosmos continues to have the importance expressed in the story of Noah, where God, determined not to eliminate all human life, is said to have ordered Noah to build the ark and to take all creatures two-by-two to keep their kind alive. The anthropic principle seems to suggest that intelligent life is important in our universe. On the other hand, as a latter-day teleology—as a way of providing evidence for the existence of God in the cosmos, if you will—the anthropic principle just doesn't work for me.

MG: Why doesn't it work for you?

AMR: Its logical structure is tautologous—necessarily true. The universe *must* have a structure that permits human life if we are to be observers of it. In this connection I like Rudolf Kippenhahn's remark (quoted in Breuer 1990), that "we should beware of falling prey to the logic of the medieval monk who averred that we should be grateful to God for arranging things so that the sun shines during the day rather than at night when it is no use to us" (p. ix).

MG: Hmmm—. The anthropic principle is mixed blessing for a theologian as well. It can be understood as yet another attempt to *prove* the existence of God—an attempt which, although it is perhaps

more appropriate for our time, seems, like the classical proofs, to claim too much. For example, the ontological proof seems today to rely too heavily on classical logic; the cosmological proof, to move too quickly to universal conclusions; and the teleological proof, to claim too precisely for the analogical imagination. On the other hand, the "proofs," old and new, do at the least give evidence of the propensity of human beings to ask limit-questions—questions that we can ask but can't answer—and these questions point to the religious dimension of human intelligence.

AMR: I wonder if the view of the world as sacred, a view you said earlier was held by some theologians—I wonder if that view isn't also a limit question. We do ask about the future of planet Earth but we can't answer. Ecologists can't tell us what the world will be like in the future even if we follow the courses of action they advocate today.

MG: These days most serious and intelligent persons care about the future of planet Earth. Postmodernism with its view of reality, as embodied in the structures of language and institutions, has lent poignancy to this concern because of the overwhelming power of destruction now available to human beings. At the same time, theologians, like Sallie McFague in her book *Models of God: Theology for an Ecological, Nuclear Age* (1987), make the case that the quest for absolute power was mirrored theologically in the conception of God as having supreme power. These theologians question the adequacy of such an understanding of God. Many of these same theologians would prefer a model of God as conservator.

AMR: My environmentalist friends tell me what we should be doing to forestall the scenario we fear—the destruction of Earth's ecosystem. I wonder if they think that preserving the quality of our environment on Earth will preserve the human species? Sometimes I think they would welcome the loss of the human species if that loss would forestall the destruction of our planet's ecosystem. If they think the Earth can be preserved in that way, they are neglecting the extraterrestrial threats to the environment. We need to realize that we can't protect Earth's biosphere against all possibilities of destruction. Perhaps we've given the wrong answer to the question, What's the problem? Perhaps the first problem is the preservation of the human species? And perhaps preserving the human species means migrating into outer space.

MG: If human beings were to propagate into space, how much longer might human life exist in the universe?

AMR: If we stay only on Earth, we might last anywhere from a

few decades to a few millennia. However, if we begin to inhabit space before Earth's ecosystem is destroyed, human life might last anywhere from a few million years to the end of the universe. It depends on how far and how fast human beings spread out, first from Earth, and then from the Sun. The most serious threat is the one that is most immediate, and that appears to be the possibility of Earth being struck by a large asteroid, one of the kind that may have made Earth uninhabitable for the dinosaurs.

MG: But that was millions of years ago. If there were still asteroids in the solar system that might hit Earth, wouldn't they be visible to astronomers?

AMR: Our ability to see asteroids in our neighborhood is much improved with the presence of the Hubble telescope in space, especially since the Hubble optics have been repaired. And a serious proposal has been made to initiate an asteroid-watch program with the intention of intercepting and deflecting any asteroid found to be in an orbit that would bring it too near Earth.

MG: You mean blow it up before it got to us?

AMR: That would be one way. Alternatively, it might be necessary and possible to push it out of the way with a large rocket. It depends on how far away the asteroid is when it is first seen, in other words, how much time there is before possible impact with Earth.

MG: How much time do we have before such a collision is likely?

AMR: That's hard to say. Some scientists think that massive objects hit Earth with a frequency of the order of once every 20 million years. Numbers of this kind are based on the rates of prior extinctions of species found in the fossil record. In mentioning a number like 20 million I don't mean to imply that we have that much time before the next hit. A massive collision has some probability of occurring even in the next ten years or hundred years—the longer the period you consider, the higher is the probability.

Another limit is the time we have before the Sun begins its next evolutionary move to become a red giant star. That eventuality will make the entire inner solar system uninhabitable. By that time human beings will have to have migrated to orbits around other stars. That migration will take place from space and not from Earth. The crucial move is the first one—from Earth into high orbit around Earth. That move is technologically within our present capabilities.

MG: Even if we were to decide that we should develop colonies in

space, doesn't the recent failure of the Mars mission suggest that we may not have the capability of populating space?

AMR: There are a couple of responses that can be made to that objection. Number one, we have gotten very good at flying all over Earth and we still have an occasional failure: once in a while planes crash. So a mission failure should not suggest that we don't have technological capability. Number two, that mission had no human beings aboard. There was no intelligent life available there to respond to an emergency, to repair or replace a nonfunctional piece of equipment. A spacecraft with a crew has a greater change of completing its mission than spacecraft of the same complexity that has no one aboard.

MG: Granting that we could live off Earth, then, do you think we should commit large sums of money to a major effort to develop space for human beings?

AMR: My short answer to that question is yes. I think we have responsibility to preserve the human species. It seems to me that a theologian's view of the world might help with this question. Are there any clues that might indicate that God expects us to take on such responsibility?

MG: I don't recall the question's being raised in quite that way. Are you suggesting that we need to have a sense of what we are doing and why we are doing it—that we need to have a goal?

AMR: People used to speak of the will of God. Is there any sense of God's will in this picture? In other words, do we have a mandate with respect to the future of the human species? Are we charged with major responsibility here? The Bible tends to talk about election and covenant and a goal that is eschatological—but without details. So insofar as human beings are trying to find perfect existence by doing God's will rather than things contrary to God's will, how are they to find out what that is—particularly with regard to the situation of a threatened world? How can we know if we are on the "right track"?

MG: First of all, I'd hesitate to use the term *God's will* to designate the "right track." The concept of God's will is difficult to work with in contemporary theology. It belongs to classical faculty theory and has connotations of an all-powerful, omniscient God who wills particular things in advance with a minimum of human participation. I can't speak about God's will.

AMR: Well then, let's weaken the question substantially and ask about God's desires. If those desires are to be fulfilled, human beings

are going to have to cooperate. We have to participate in the action that leads to the fulfillment of those desires. But to participate we have to have some sense of what the goal is. Can theology help us here?

MG: One direction is to think about the whole network of terms referring to God's desires, some of which we have already used—mandate, will, participation, co-creation, frustration, lure, design, cooperation, initiation. Second, I think that it is important to avoid jumping to a course of action from which there can be no returning. The concept of a reversible process, which I think originated in your discipline, would be a good compromise: ideally, whatever direction we embark on should be reversible if new evidence calls for a change in direction. Embarking on a course of action that necessarily destroys other options is at least as questionable as the intent to take no action. Specifically, we should not cease investing in the preservation of life on Earth even as we invest in extensions of habitations beyond Earth. But as your discipline also makes clear, as in the theory of thermodynamics, many processes are not reversible, like it or not.

AMR: Precisely. And especially for this reason, there still remains the question of goal. Do we think, for example, that the issue is one of preserving Earth or of preserving the human species? These different goals may require different responses.

MG: Well, that's what we're about, to suggest that in times of great conflict, and when the needs of people are not only immense, but known in an immense way—known almost immediately in our modern communication system—it's tempting to arbitrate the immediate needs of people (jobs or the environment) rather than to argue for an expensive space program that promises major results only in the long run. I think that when you have a plurality of positions, it is best to encourage the expression and critical discussion of all of them. Then the goal may become clear. That's what hope is all about.

AMR: Well, from my point of view as a physicist, in considering matters of this kind, I fear that we might go on indefinitely saying that the way will eventually become clear. I think that the way *has* become clear. We now have reason to believe that Earth is under pretty constant threat not only from actions of human beings trying to squeeze sustenance from it, but also from its cosmic environment. The comet Shoemaker-Levy 9 has broken up, and its fragments fell on Jupiter in July 1994. It should come as no surprise that there is

a significant probability that a similar cataclysmic event could wipe out higher forms of life on our planet. If we know with some reasonable probability this is the case, doesn't our humanity require us to respond?

MG: Yes, but I think that maybe there is a significant difference here between a physicist's and a theologian's point of view. The theologian at this point becomes very aware of what Bernard Lonergan called the possibility of the long decline—the foibles and the biases which the scientific point of view, like any other, is subject to. In making a statement such as the one you just made, you are ignoring these negative factors. So I would keep a skeptical view of process so that we don't go galloping off Earth to the detriment of current Earth-dwellers. And this optimism that the way has become clear . . . I'm not so sure that that in itself isn't too naive a reading of whatever we call God's desire.

AMR: I'm surprised that you call it optimism. I would call it pessimism. I said we expected with significant probability that Earth will be destroyed. Look, it's common wisdom that financial investments should be diversified—not put all in one place. Doesn't it stand to reason that the human species should not be all in one place? As far as we know, God's greatest investment is in life, especially in the life of the human species. I have always understood that we are stewards of God's investment. It follows that it is up to us to see that it's diversified.

MG: What's the *it?!*

AMR: The *it* is God's investment in us as intelligent beings in the universe. When there's a threat of extinction, I am dissatisfied with just keeping the discussion open and relying on hope. It seems to me you're neglecting the risk that action will become impossible because too much time is lost in discussion, negotiation, and, as you said, hope.

MG: Hope is not time lost—it pervades both action and reflection. Hope resists the awful sense that we can do nothing effective toward a gracious long-lived human future.

AMR: I'm pressing for the notion that there must be some kind of goal, and intrinsic to that goal in some way is the preservation, the sustaining of the human species. Are we or are we not, at some stage, responsible for the continuation of the human species? Can we answer that question?

MG: I think you have posed the central issue. I used to think that

most people would without hesitation say "yes" to saving human beings before saving the earth, if they had to choose. I wasn't prepared for the deep pessimism that now exists about the future of the human species.

AMR: There *is* a deep pessimism out there about our future. Also cited in this issue of *Zygon* by William Klink, E.O. Wilson's article "Are Humans Suicidal?" in the February 1993 *New York Times* magazine section describes our current environmental situation and proposes that the human species may be suicidal.

MG: Nevertheless, it seems to me that posing the issue is already to have taken one step further toward action. To agree that the human species is the responsibility of human beings is one step that needs to be taken before we can address any of these other questions.

AMR: With the end of the second millennium at hand (not just the end of the century), there is in the public realm an aura of contemplation and deliberation—reminiscence rather than action. We shouldn't be comfortable just thinking about possibilities. At some point inaction or indecision becomes worse than uncertain decision or imperfect action.

MG: In some sense, that question is a limit question. Traditionally, such a question has distinguished the prophets who demand action from the mystics who create new ways of thinking about the experience of the whole. Method forces us to reflect on how we should engage in action—what we should do, not just how we should act.

AMR: Perhaps I can change the question somewhat. Instead of asking whether God might require us to maintain the human species, let's ask whether human beings are essential to God. What can the world do without and still have God?

MG: We were talking about how the term *limit question* refers not only to questions we can ask but can't answer but also to the likely results of asking this kind of question. T.S. Eliot thought that what we have about such matters are hints and guesses—hints, we could say, followed by guesses or wagers. We have no final answers to the question you ask, but there are some clues.

There are stories about the differences between gods or goddesses and human beings—like the Gilgamesh epic. Such stories lament that human beings lack what it takes to be gods or goddesses, but the stories also celebrate the potential participation of human beings in godship by being able to consider what it would be like to be a god. In the Genesis story, human beings take on the responsibility for

procreation, and their development of knowledge and language creates the potential for the human species to become immortal, even though all individual human beings must die. The pre-Socratic Parmenides thought there was no universe without a knower—"What is . . . is identical with the thought that recognizes it."[2] In the Gospel of Matthew (10:40), the Christ is given to say to those going out in his name: "To receive you is to receive me, and to receive me is to receive him who sent me"—again, suggesting a continuity between his God, himself and anyone who would "receive."

AMR: Can theology give us anything more definite on the basis of these hints?

MG: Taken together, these hints suggest a participatory role for human beings in God. The early twentieth-century development of these ideas by process theologians such as Charles Hartshorne, John Cobb, and Marjorie Suchochi is called panentheism. Panentheism is different from pantheism, which saw god in everything and particularly in nature. Most forms of panentheism point to the philosophical notion of being and focus on the special kind of being that human beings are. The force of this emphasis can be seen in Genesis, for example, where both the specialness of human being and its relatedness to other living beings are maintained. In the Genesis story, after the waters of the Deluge have subsided, the character of God says that God made the covenant with human beings and all living beings. Here human beings are doubly differentiated from both God and other created beings and related by virtue of their consciousness and of their special ability to participate both actually and analogously in the activity of God. The term "imago Dei" captures this double aspect of differentiation and participation.

AMR: Are you saying that consciousness and particularly self-consciousness is one of the characteristics that suggests that human beings have a divine role in the universe—or something like that?

MG: Yes, I think that the emphasis needs to be on participation. In the nineteenth century, Hegel—although he was not nominally a panentheist—grandly spelled out the notion of a developing God, a God that is self-reflected in progressively higher forms of human consciousness. We need to measure Hegel's paradigms critically—he saw the gods (no goddesses) of contemporary religions as embodying more of Spirit-consciousness than tribal gods, for example. Nevertheless, his concept mirrors the contemporary insistence that, as David Tracy wrote, "Given the fact that the basic metaphysical analogy for reality is the self and the self's own experience as intrin-

sically social and temporal, God too—precisely *as real*—is to be understood as social and temporal" (1975, 181). This form of panentheism suggests the specialness of human beings, by virtue of their special form of consciousness as directly related to the consciousness of God.

AMR: Haven't some theologians thought that God was the "other" or "wholly other" than the human species? Now it seems to me that we are talking about a God that includes human beings.

MG: Well, in the order of knowing, God is an object of human consciousness. In the order of experience, God and human beings are in some sense objects for each other. In some forms of panentheism, God is a dipolar reality—not an either/or.

AMR: But other things are also objects of human consciousness. God is not different in that respect.

MG: True, but God is a kind of limit-question. All of the questions such as the classical ones about knowing and not knowing the will of God indicate that human beings usually know and make claims about human beings in a way different from the way they know and make claims about God. And in language these claims about the relationship of God being, human being, and other being often take the form of story, analogy, and metaphor. These claims point to a peculiar aspect of the totality of being that has been called "limit-language," "limit-question," or "limit-concept." Those who write about Christian spirituality often refer to this totality as a combination of kataphatic (the path of knowing) and apophatic (the path of *not* knowing) consciousness.

AMR: There's something of both knowing and not knowing in the story of the flood. Noah knew only what he was told. There was much that he didn't know. He had no view of the future, neither a theological view nor a scientific view, let alone a higher viewpoint on the issue. If Noah were to save the human species today, perhaps by taking some of them into space, in order to be persuasive he would have to claim that he knew more than what God told him.

MG: It's very interesting that in traditional treatments of the story it isn't at all the case that Noah is admired for the role he played in the story. Some Jewish commentary takes Noah to task for being too passive—he didn't challenge God on what he was told to do; he didn't talk back to God. If Noah could convince people to go with him today, where would he take them, to Mars?

AMR: If human beings were to go to live on Mars, it is true that

they might be able to repopulate a devastated Earth. But actually, it is unlikely that people will choose to live on Mars—at least in the beginning.

MG: The Moon then?

AMR: Even the Moon has significant disadvantages compared to living in space. For example, like Earth, one side of the Moon points away from the Sun. Unlike Earth, the Moon rotates on its axis about once a month so that a night on the Moon is two weeks long. And there are problems getting on and off the Moon; there is still a considerable gravitational force on the Moon.

MG: Where would people live, then?

AMR: Some scientists think it would be best to start by building space cities in high orbit around Earth. Think of linking together a few buildings the size of the World Trade Center in New York City, or the San Francisco Hyatt, or larger still, the Mall of America. In the early part of this century ocean liners provided large and comfortable life support for many travelers. Large structures are even easier to build in the weightlessness of space than they are on Earth. Moreover, the transportation from one place to another in space requires very little energy compared to lifting off from a massive planet or the Moon. In addition there is sunlight—the cleanest form of energy—available in virtually unlimited quantities and on a continuous basis.

MG: But somehow it seems so unnatural for a person to be born in space and live out her life there. It's hard to imagine how human bodies and spirits, removed from all that has nourished them—the environment, culture, institutions—will survive *as human* in space.

AMR: Environments can be designed and constructed, and cultures and institutions can be moved. We've always had difficulty imagining how human beings would develop their worlds. What seems highly "unnatural" in one century can become commonplace in the next. There's the wonderful example of a letter written to President Andrew Jackson in 1829 by Martin van Buren, then governor of New York. In one section of the letter van Buren complains,

> As you well know, Mr. President, "railroad" carriages are pulled at the enormous speed of 15 miles per hour by "engines" which, in addition to endangering life and limb of passengers, roar and snort their way through the countryside, setting fire to the crops, scaring the livestock, and frightening women and children. The Almighty never intended that people should travel at such breakneck speed.

MG: Clearly it's difficult to specify God's intention at any particular time in history. In retrospect, human beings rarely seem to have adequate imaginations for the task. But it seems to me that the differences for the human beings who would live in space are of a magnitude scarcely comparable with changes now familiar to earth dwellers.

AMR: Ursula Goodenough (1994) speaks of organisms living in a niche—a collection of environmental domains. She points out that an organism must "operate in the context provided." It struck me at the time that the human species has become an organism that can *design* the "context" in which it plans to live. Astro city-states might just be the next major advancement in our ability to provide a niche for ourselves in a difficult environment—the environment of outer space, in this case one of the most general, even commonplace, environments in the universe.

MG: What you are proposing sounds something like genetic engineering to me. How do people react to this idea?

AMR: When I've lectured on the subject to college audiences, one of the first questions is almost always: What will you do with the bodies of the dead?

MG: This sounds to me like a practical expression of an eschatological concern. As a theologian, I would try to address this interest in terms of godship as well as the death of individuals. If we turn to art, we find that much of the iconography of the Middle Ages supported this notion of collective godship. The whole notion of mystical body—in those days it was spoken of as the Church, the church triumphant, the church suffering, and the church militant (all these words take their values from networks of meaning significantly different from our own) with Christ as its head. When we look at some of these icons, for example, the *Mother of Mercy* by Piero della Francesca, we see one body—one participating agent actor—in which all human beings participate.

AMR: If I understand what you are saying, from a theological perspective, the human species is a body, basically. So what's the relation of that body to God and world? That's the central theological problem, isn't it?

MG: Yes, *yes!* And these icons of course did not call the church God, but again there were terms for the church, like the Mystical Bride of Christ, so that participation was always presumed on the analogy of a body—a bodily basis, one might say. The importance

of bodily life in the presence of God is one of the most long-lived emphases in Christianity. In this image of corporate body, we have a reflection of the prophetic dimension—

AMR: —Of what?

MG: —of religion, of theology—

AMR: But we're talking about the world now.

MG: —the prophetic dimension of theology as it looks at the world.

AMR: OK!

MG: And the prophets of the world tend rhetorically to make distinctions between God and human beings because they want to impress upon human beings the dire effects of their failure to act.

AMR: Hear! Hear!

MG: —and of their badly conceived actions. The mystical dimension of theology, by contrast, emphasizes participation and oneness in God.

AMR: But does the mystical carry any equivalent pressure to do more than worship and deliberate?

MG. I think that's the strength of the notion of participation. It moves mysticism from being a merely reflective activity to one . . . well, there are many moments in action. There is the initiating moment. There are culminating moments of action.

AMR: We seem to be avoiding until the very last moment the actual action itself. We begin and wind it up. But how do we . . .

MG: What are you saying? I don't understand.

AMR: It all seems to boil down to deliberation, to talk about it ahead of time, and to talk about it afterwards. And for me discussion isn't decisive action.

MG: Why must you dichotomize talk and action? What does it mean to say that discussion isn't action? We have all experienced conversation and arguments that provided some needed clarity or challenge to bring about better action. Besides, there's a whole well-known body of literature (which I'm sure you know also) on speech *acts*. For example, J. L. Austin analyzed what is accomplished by the locutionary, the illocutionary, and the perlocutionary dimensions of speech (1962). I spoke of an initiating moment in which action can be seen to emerge within speech, but that moment is capable of having all three dimensions of a speech act as well.

AMR: What do you mean by an initiating moment?

MG: When the action starts to take place—when the hard work of moving things in a particular direction begins. And then at a certain point someone says, "Look how far we have come." That's what I mean by a culminating moment.

AMR: With respect to the issue of the fate of the human species, where would you say we are now?

MG: We are deliberating on the issue on whether or not the continuation (as distinct from the fulfillment) of the human species is the *primary* human responsibility.

AMR: Perhaps we need to substitute the concept of process for that of progress. The inexorable quality of change is much more neutral than the idea of continuous improvement. In the notion of process, there is no necessary implication of moving toward the perfect or the good. By using the concept of process we can avoid the implication of improvement and still include the implication of a goal. Process does not imply chaotic change but rather change that moves toward. If we can't be explicit about the future states of a system, then we do not understand the process—the change the system is undergoing.

MG: I find the notion of process helpful, but we must not lose the focus on what life is about. This raises the question of the extent of the sacred. Even the psalmist speaks of that human as giving voice to the remainder of the cosmos. So there is a sense in which human beings are not only special but crucial to making the remainder of the universe sacred. On theoretical grounds, we need to redefine world to include the cosmos but not leave Earth behind.

AMR: Just as some say that there is no human freedom so long as there is one human being who is not free, some say that to consider human life sacred it is necessary to consider each human life as sacred. But, if we are to fashion principles that are the basis for the most general conclusions, we must operate in exactly the reverse mode. We must have the most general categories we can find. In reaching for this high level we might even reach a point where we would have to acknowledge that there is human freedom so long as there is *at least* one human being who is free and that the sacredness of human life can continue to exist just so long as there is *at least* one procreative pair of human beings alive.

MG: I know that some people have reacted very negatively to the idea of human beings moving off Earth to live in space. Some say we

are running away from problems here on Earth; others say that it is a solution for a few technologically sophisticated persons who are leaving the others behind to cope as best they can. What can be said to reduce the misunderstanding here?

AMR: If, as I hope, the development of space for human habitation is an international undertaking, it has a chance to be a multicultural affair as well. Perhaps it is most important to remember that no one reading this will be going on this human adventure. This undertaking is for the children, and their children, and theirs, and theirs, and theirs . . . in order "to keep their kind alive," as God said to Noah.

MG: When the classical texts of the historical religions were written, Earth was the universe in which human beings lived. The stars were thought to be in a separate realm. Now we understand human beings to live in a universe that includes the stars, the star clusters, the galaxies, and so on. People have been doing theology for at least 2,400 years.

The genres of special revelation—dreams, visions, mandates, apocalyptic—point to the need for deliberation and discernment as the way to action if we are to be responsible world-dwellers as well as responsible selves. Even if we had a mandate, merely knowing the direction and even the rate of change is not enough. One needs to have an idea of what state of affairs lies out there in that direction. For example, my friends in the environmentalist movement make good suggestions about the ways we must behave if we are to prolong the viability of Earth. Don't you agree that we need to reduce the rate of deforestation and the rate of release of chlorofluorocarbons and sulfur dioxide into the atmosphere—all for good reasons?

AMR: I do agree that we must inhibit and postpone the degradation of Earth's life-support system. It seems clear to me that we do not have world enough—human beings have already strained the carrying capacity of the planet, and the planet itself is subject to cosmic accident. However, for the human species to continue, we must also diversify our location; we need to find ways to begin living in space.

MG: Sir John Templeton said, "God has placed us at a new beginning." The question, since we do not have world enough, is, "Do we have time?"

EPILOGUE

MG: The view of the world we are now discussing has become a bidisciplinary view—neither a physicist's view nor a theologian's view. The discussion of this bidisciplinary view of the world is not over. Indeed, it has just begun. But perhaps our purpose here today has been fulfilled. We wanted to demonstrate movement to a higher viewpoint by means of bidisciplinary argumentation.

AMR: Our analogy for the higher bidisciplinary viewpoint is binocular vision. The left eye sees one view, the right eye another. The two views are commensurate only in the three-dimensional view that is both different from each individual view and more.

MG: In bidisciplinary dialogue, both individual points of view must be accepted. Neither view can be allowed to dominate as the discussants strive for agreement. The more each view is preserved, the more valuable and effective will be any higher viewpoint that may be achieved.

AMR: Of course, the success of any higher viewpoint attained must finally be measured in terms of the usual criteria of coherence, cognitive efficacy, and eventual acceptance by the communities concerned.[3] As Karl Peters said at this symposium, "The future is open."

MG: "There's more to be done."

NOTES

We wish to thank Robert John Russell for critical comments and suggestions marked on an carlier version of this dialogue. However, responsibility for the contents of the final version remains ours.

1. Marvell's application of this text in "To His Coy Mistress," is, of course, to a dffferent subject. But his meaning is clear and subsequent lines also relevant for our own: "Had we but world enough, and time . . . we would sit down, and think which way to walk . . . But at my back I always hear/Time's winged chariot hurrying near . . ."
2. As cited and paraphrased in John Archibald Wheeler (1974): "No one to think, no one to know? Then no world!" suggesting, from the classical point of view, a special knower of the universe *as* universe.
3. See Gerhart and Russell (1984), especially chapter 9 on verification and validation.

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