

THE DIVINE CONJECTURES: A CONTEMPORARY ACCOUNT OF HUMAN ORIGINS AND DESTINY

by Allan Melvin Russell and Mary Gerhart

Abstract. Six “divine conjectures” frame the place of Theóne (The One to Whom we pray) in the creation of our universe and for its continuing development in five subsequent stages into a loving universe. The first stage, the cosmological universe, establishes the laws of nature, understood by scientists as the “standard model.” The second stage introduces life and death into the universe by a process we are only now beginning to understand. Stage 3 requires certain life forms to become conscious with a subset of those life-forms acquiring language that results in that subset becoming self-conscious. The next stage, Conjecture 4, identifies certain persons who become addicted to learning in their unrelenting effort to learn as much of what can be known as possible. The fifth conjecture requires individual persons to act as agents of Theóne in achieving Conjecture 6—a universe that is both loving and lawful. During the course of the exposition subsidiary discussions of the concepts of *conjecture* and *hypothesis* explicate the function of each in the advancement of knowledge and understanding. There are brief discussions of prayer and purpose in relation to the Divine.

Keywords: agents; conjecture; consciousness; death; divine; hypothesis; laws of nature; life; loving universe; prayer; self-consciousness; students; Theóne (The One to Whom we pray)

ON CONJECTURE

We call this essay a contemporary account of human origins and destiny with the hope that such an account will enhance our understanding of cosmology as having universal purpose. We here state why we think “conjecture” is appropriate for this topic.

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Why conjecture? A conjecture is the best story one can tell when the evidence supporting the state of affairs in question is insufficient. A conjecture in mathematics (for example, Goldbach's Conjecture) is a statement that is true for every example observed but lacks the sufficient evidence—the proof—that would promote the conjecture to the status of a theorem. In jurisprudence, a prosecutor's case can be understood as conjectural when the case made by a prosecutor to a jury concludes with a story that is supported by evidence thought by the jury to be insufficient. (Cases with sufficient evidence are less likely to come to trial.)

However, to invoke a hypothesis is to make a guess that calls for an investigation. In the natural sciences, the stating of a hypothesis is the first step in a research program. Karl Popper gave us the now widely accepted principle of falsifiability: After stating the hypothesis, the scientist is to go out and search for contrary evidence. Popper was very sensitive to the logical structure (If *A*, then *B*) of an implication (the hypothesis), which can be disproved on the basis of evidence (not *B*, then not *A*) but cannot ever, in principle, be proven.¹

Hypotheses are assumptions about some state of affairs. If a hypothesis is found not to be in accord with what is said about a specific state of affairs, it is discarded and usually replaced by other hypotheses. When a state of affairs is examined and found to be in accord with what is said about it, the hypothesis (usually in conjunction with other related hypotheses) becomes a theory—and not “merely” a theory. A conjecture may turn out to be correct or incorrect if and when the insufficient evidence is made sufficient (for example, by additional evidence). With sufficient evidence, a conjecture becomes a true story.²

The words *hypothesis* and *conjecture* often are used interchangeably. Either could be used to refer to an aspect of religious experience. William James wrote, “We cannot live or think at all without some degree of faith. Faith is synonymous with working hypothesis” (1882, 79). His statement is helpful in noting the intrinsic role of faith in everyday human experience. However, the word *conjecture* may be more appropriate than *hypothesis* for what he is referring to.

An effective way to sort out the distinctions between these terms is to use both in a single setting, preferably one in which faith and hope are more clearly represented than they are in jurisprudence. We propose doing this for a setting in medical science. The related concepts sort themselves out as follows: *Conjecture* is related to making a diagnosis and providing treatment to a patient. Evidence for a diagnosis is often insufficient. (Some diagnoses—Alzheimer's, for example—can be made only posthumously.) This part of medical science is understood to be medical practice. *Hypothesis*, by contrast, is related to medical research into theories of disease, including causes, symptoms, and treatments. A hypothesis is a proposal for research, sometimes merely a guess, regarding a theory of some disease. If

the hypothesis is judged a good one, the medical research scientist tests the hypothesis, which, if shown to be correct, becomes a theory (a new part of the theory of disease). If the hypothesis is proven incorrect, it is discarded.

Notice that technically the hypothesis is not proven correct. Confidence in a scientific theory grows as its successful application increases.

THE DIVINE CONJECTURES

We offer six conjectures to serve as the framework for understanding the origin and purpose of the universe and of the human species. The conjectures are called divine because they are framed within a theological worldview, a view different from though related to traditional theological views. We aim to demonstrate that human beings pray—that it is characteristic of human beings to pray, whether they are aware of their praying or not—and that the act of praying points to the implied existence of a “one” to whom prayer is directed. That one we call *Theóne* (pronounced *The-* as in “thesis” and *-óne* as in “phone”).

In one sense, of course, these are conjectures about the Divine—how we might think appropriately of the phenomenon called the Divine. In a more important sense, we conceive of the conjectures as originating from Theóne—that is, as actions of the Divine from our perspective of the way things are today and what things were in order for things to come to be the way they are. As will become clear, the six divine conjectures refer to the course of development of the universe, of Earth, and of the creatures we call human beings.

- Conjecture 1 There will be laws of nature.
- Conjecture 2 There will be life and death.
- Conjecture 3 There will be consciousness and self-consciousness.
- Conjecture 4 There will be students.
- Conjecture 5 There will be agents.
- Conjecture 6 There will be a loving universe.

Conjecture 1 addresses the time of the explosive origin of the universe. We call it the Primal Explosion (rather than the Big Bang). It generates the “rules” by which the universe will operate. Conjecture 2 invokes the creation of life, a process we do not yet understand, although our degree of understanding has been increasing rapidly since the 1950s. Conjecture 3 calls for living things to respond to their various environments in various ways. We are presently limited in our ability to predict how a particular life form will respond to different environments without observing it in those environments during the time it is alive.

Conjecture 3 also calls for living things that are self-aware, that possess self-transcendence. Such creatures know both “who” they are and, for the most part, what they know and don’t know. Conjecture 4 expects certain

human beings to be “addicted to learning” (*Oxford English Dictionary [OED]* definition of *student*)—to dedicate their lives to learning more about the “world” and the cosmos that contains it. Conjecture 5 calls upon human beings, as intelligent agents of Theóne, to take responsibility for the future of intelligent life in the cosmos—to do what must be done in the end-times to achieve a loving universe, the final Conjecture 6.

Conjecture 1: There Will Be Laws of Nature. At the beginning of existence, about 13 billion years ago, there was a point. A mathematician would call such a point a *singularity*, a point with no size. What that point lacked that a mathematician might expect is a location. This singularity had no location because there was no such thing as space or place. What the point did have (all that could be said to characterize it) was a virtually unlimited amount of mass/energy.

Mass/energy, for those not familiar with physics, is expressed in Albert Einstein’s famous equation $E=mc^2$. An amount of energy, E , is entirely equivalent to an amount of mass, m , when the latter is multiplied twice by a number equal to the speed of light in empty space. It is somewhat odd that Einstein’s theory of relativity—the “special” electromagnetic theory, not the general gravitational theory—refers to an absolute quantity, the speed of light in empty space. Einstein’s relativity theory is not, as is sometimes suggested, a theory about everything being relative. The speed of light in empty space is 299,792,458 meters per second, or about 186,000 miles per second.

To get a feeling for this mass/energy relationship ($E=mc^2$), consider a copper BB. How long would the mass energy of this copper BB light an efficient 60-watt light bulb (fluorescent rather than wire)? Answer: The bulb would burn continuously for 7 million years! This astonishing comparison of energy and mass gives us a sense of the magnitude of the Primal Explosion at the Beginning³ when the mass of the universe existed as radiant energy.

How much mass/energy was there at the beginning of the universe? We do not know, because the mass/energy of the universe, a quantity that has not changed since the beginning, includes a vast amount of mass that we cannot see because it does not shine as stars do. This mass is called dark matter, and it exerts a significant gravitational attracting force on the rest of the universe.

The first instant of existence began with the explosion of this massive point or singularity. The first laws of nature, called the standard model of the creation of elementary particles, describe how the particles come into existence from energy. In the beginning there is only mass and energy, which are equivalent in the sense that a particular amount of mass is equivalent to a particular amount of energy. If these were the only laws of nature, high-energy particles and photons (light particles) are all there could ever

be. But the universe contains more than mass and energy. Although one can say that all we see when we look around is mass and energy, the variety in the things we see is a result of combinations of atoms. Atoms combine according to subsidiary laws (chemical) that are derivative of the original laws that came into existence at the time of the Primal Explosion.

Conjecture 2: There Will Be Life and Death. With the formation of single-cell organisms, life came into existence. Death was not part of the universe at the beginning of life. With the formation of multicellular organisms, death came into existence. Unicellular organisms have fewer difficulties in reproducing and surviving after reproduction than do multicellular ones. Single cells are potentially immortal because they do not die. However, this potentiality does not exist universally. Indeed, it is a conundrum, according to philosopher of science Karl Popper, “why natural selection should have produced anything beyond a general increase in rates of reproduction, and the elimination of all but the most fertile breeds” (1972, 271).

The fact of death is ordinarily seen as negative at the level of human existence. We view death as unfortunate, even (mistakenly) as evil. However, theologian William Ernest Hocking pithily noted some generally positive features of death:

Without death, the inequalities of age alone would become monstrous, and the growing emotional disparity between ancients and beginners insupportable.

So far as there operates in society the rule that to him that hath shall be given, all the geometrically-growing advantages of power and prestige require a natural terminus if they are not to destroy the access of man to man on which society rests.

Death furnishes [. . . demonstrable] proof that no man is necessary to the race, and so the sanity of the species, always running to the ease and vicarious elevations of hero worship, is from time to time restored. (Hocking 1957, 12)

Hocking’s comments presumably pertain to a stable population, female and male. In a finite living situation, there is a limit to the number of lives that can be sustained. The problem of limits to growth is not unique to human beings but pertains to all living creatures as they require more and more resources.

Today, in biology, the biggest problem continues to be our failure to understand the origin of life. And, despite great effort on the part of skilled biologists, it has not so far been possible to create life from nonliving elements by artificial means. Here is the prediction made by a prominent biochemist thirty years ago: “The great simplification that emerges from cryobiology experiments is the rather certain knowledge that the problem of synthesizing a living cell is within the domain of our existing conceptual framework. The task, in principle, merely requires a team of super sophisticated chemists adept at complex syntheses” (Morowitz 1978, 52–53).⁴ In

spite of the remarkable confidence that it will be possible to create artificial life, no success has been achieved on this question. The origin of life continues to be a mystery.

A different concern today is what would happen if Earthly life were destroyed by one of a list of known catastrophes, such as nuclear warfare, lethal pandemic, collision of a comet with Earth, a new ice age, or global warming. The possibility of life's existing or having originated on other planets has drawn the attention of biologists and cosmologists. A recent book on evolution by Simon Conway Morris claims that if evolution were to begin a second time, it would likely take the same path as it did originally (2003, 283–84).⁵ Differences in environments notwithstanding, he argues that if we go out into the universe and find life, it is going to be a lot like us, because the origins of life and the development of life participate in the same processes throughout the universe.

Conjecture 3: There Will Be Consciousness and Self-consciousness. Although the creation of life eludes human accomplishment despite a deep understanding of the biochemical structures and conditions, the understanding of consciousness appears to be mired in disputes between experimental psychologists, who seek to connect states of consciousness with corresponding brain states, and philosophers, who believe that necessary answers must be obtained by careful definitions of concepts, logic, and descriptive phenomenology.

By *consciousness* we mean the ability of a living thing to respond to external stimuli. The morning glory opens and turns toward the sunlight; the deer raises its head when something is heard in the underbrush; the dog salivates when it hears its food dish being filled. All of these show evidence of consciousness. When robots are built that can be controlled by a detectable signal, we ask if these robots can be considered conscious in the sense just described. In this example we stray from the requirement of life to wonder if nonliving objects (such as television sets) need to be included in the class of conscious things.

Fortunately for our present investigation, the second form of consciousness, *self-consciousness*, also called transcendence, is of much greater significance, and we leave the possibility of robotic consciousness for the inventors of mechanical workers.

We think that self-consciousness is inextricably bound up in “spoken” language (Jaynes 1976). When we ponder, we “talk” to ourselves—about the choices we have, about our desires, about the various means we have of effecting those choices. This person with whom we have our silent conversations is our self who is our constant companion, not always invoked but always ready to participate in deliberation. We question ourselves, we make demands, we scold, and we regret. It is this ability to objectify ourselves that opens the gates to learning, to the practice that makes perfect—per-

fect according to our standards for good understanding. There will be no students if there is no self to be taught.

Requiring language settles the question of consciousness with respect to animals—our dogs, cats, and other domestic pets. Often these are uncritically admitted into the ranks of the self-conscious, but it cannot be so. The mumbly growls and whimpers, the meows and purrings notwithstanding, our animals, however loved, are not to be included in the ranks of the self-conscious. Intentions they may indeed have, and many actions will be undertaken on the basis of their desires and intentions, but they have no capacity for critical objectivity, explored in reflection, that is going to change their actions. In the end, they cannot be held responsible.

Conjecture 4: There Will Be Students. What is a student? Odd question? Those of us in academic life are students or work with students all the time. And we work with a host of other things we have not defined. In the *OED* the first definition of *student* is “one who is engaged in or addicted to study.” Conjecture 4 states that we must have persons with intense habits of inquiry, study, and observation. Such habits can lead to experiences of inspiration and revelation.

History and prehistory are replete with persons who made great intellectual discoveries, both religious figures and natural philosophers. They had a passion for understanding. We name just a few, enough to show the variety of their achievements.

The Hebrew author of the Book of Genesis, sometime in the sixth century B.C.E., reported the discovery that human beings are both like and unlike other Earthly material: They come from dust, yet they are also images of the Divine. Pythagoras, Greek, sixth century B.C.E, discovered that the world is mathematical. Siddhartha Gautama, fifth century B.C.E., discovered the law of the impermanence of all existence. Michael Faraday, British bookbinder, early nineteenth century, without the benefit of a schooling in mathematics, explored in the laboratory the phenomena of electromagnetism. James Clerk Maxwell, consummate mathematician, mid-nineteenth century, codified the laws of electromagnetism and showed that light was electromagnetic waves. Nikola Tesla, Serbian-born technologist, late nineteenth century, saw in a vision the complete system of alternating-current electricity that powers the world today. Marie Curie, Polish-born chemist and physicist, early twentieth century, isolated the radioactive elements radium and polonium in her laboratory in France. Winner of Nobel prizes in both physics and chemistry, she ultimately paid for her achievements with her life. Teresa of India, late twentieth century, found the Divine in others—the poor and the sick.

Scientists as well as religious figures are inclined to treat the experience of receiving insight as a gift. Evidence for interpreting insight as gift often is found in first-person accounts of scientists’ experiences of invention or

discovery. Robert Pollack, biologist and Director of the Center for the Study of Science and Religion at Columbia University, wrote: “Good ideas emerge in the mind of the scientist as gifts of the unknowable” (2003, 15). Sir Lawrence Bragg, British physicist, early twentieth century, shared the Nobel prize in physics with his father for work on X-rays and crystal structure. Bragg described his experience in a lecture he gave at the Royal Institution in London on October 25, 1950:

When one has sought long for the clue to a secret of Nature and is rewarded by grasping some part of the answer, it comes as a blinding flash of revelation; it comes as something new, more simple and at the same time more subtle, and more aesthetically satisfying than anything one could have created in one’s own mind. This conviction of something revealed, not something imagined, is all the stronger because of the discipline science imposes on those who would succeed. (Bragg 1950, 280)

Notice that Bragg uses explicitly religious language to attest to the unexpectedness of the idea.

We expect that extraordinary students, as defined here, must continue with work of this kind into the future if the goal of a loving universe is to be attained.

Conjecture 5: There Will Be Agents. The word *agent* comes from the Latin word *agere*, meaning to do or to act. To be an agent first of all meant (in the classical languages) to have the capacity for actively working or operating—for doing something. But the notion of agent implies that the action undertaken is not for the self. It is doing something on behalf of another. The sense we have in mind is of being sent out to act—ultimately in the service of Theóne, The One to Whom we pray. Not having in hand a loving universe, Theóne requires agents to work toward achieving a loving universe. The realization of a loving universe is a long way off, and, according to an old song, “the age of miracles has passed.”

Examples of agency are not lacking in history. Readers familiar with the Hebrew Scriptures will recognize the classical sense of agency in this quotation from the Book of Isaiah (middle of the eighth century B.C.E.): “Then I heard the voice of the Lord saying: ‘Whom should I send? Who will go for me?’ And I answered, ‘Here I am; send me’” (Isaiah 6:8 NEB). The passage represents the classical Hebrew prophetic understanding of agency in the sense that God’s action in the world is understood as imparting a job to be done. The Divine is depicted as speaking directly about ethical actions to be taken. In the prophetic books, the Divine sometimes goes to extraordinary lengths to get the person to accept. (Remember Jonah?) Nevertheless, the person is portrayed as a free agent, free to accept or to refuse the call. In these early texts, after they have heard about the “what,” human beings usually don’t accept without asking *how* the task is to be done; but *whether* or not it should be done is rarely in question. In another classical instance, in Plato’s *Phaedrus* and in other dialogues, Socrates’ daemon

does not tell him what to do but only what he should not do (Plato 1961, especially 489c).

Why must we have agents? As time goes on, the function of students becomes more specialized, and knowledge becomes increasingly complex. If the development of life stopped with students (Conjecture 4), the purpose of life would be fulfilled by learning more and more, leaving unaddressed the misery and destruction that can be the unintended consequences of knowing more. Merely pursuing the goal of the philosophers will not in itself bring on a loving universe. With agency, the emphasis shifts to action undertaken both in response to and on behalf of Theóne. Agency requires insight into how best to work for the good of the whole, and this often comes not to just a single person but to a group of agents working collectively. Individual agents (Martin Luther King Jr., for example) are sometimes able to galvanize large numbers of people to act cooperatively for a just cause. Doctors Without Borders was founded in 1971 to bring medical assistance to people in emergency situations such as armed conflict, epidemics, natural or manmade disasters, or long-term deprivation of health care. They are agents insofar as they spend up to a year in one of about seventy countries putting current medical research into practice; they are students insofar as they return to their home institutions to continue medical research and practice. The inventors of the Industrial Revolution—Alexander Graham Bell, Thomas Edison, and Henry Ford, among others—built machines on the basis of technical discoveries made by scientists (students).

Conjecture 6: There Will Be a Loving Universe. What are we to understand as the condition for love on Earth? We choose to ask the question for Earth even though we intend to apply the condition to the universe itself. We proceed this way because of our relative ignorance of our universe as a whole. Despite great strides made by cosmologists, particularly in the past fifty years, much mystery remains, and we cannot even begin to describe what might constitute a living environment in the far future. For now we presume that Earthlike environments will be ones that support Earthlike life in the universe. If more exotic environments turn out to be capable of supporting living creatures of a kind we cannot now imagine, we will be ready to expand our definition of love.⁶

The word *love* and the adjective *loving* can be understood to apply to a broad range of living things. Of course human beings can be loving (as well as unloving), but what can be said about animals, fish, birds, and other creatures? Can insects be understood to be loving? Can flowers and trees? When considering occupants of the “peaceable kingdom,” we are excusably anthropomorphic. As we expand consideration we may find that we require the help of professional life scientists. For the present we restrict our thinking to human beings and humanlike creatures.

“All you need is love,” sang the Beatles, and in a certain sense that is true, for with love comes life support, care, and relationships. And, while death remains inevitable, love can provide most if not all of what is needed. What, then, shall we take as the meaning of *loving*? We take the primary requirement for loving to be living. Whether it is instinctive or intentional, we see love as the dominant productive relation between self-conscious living beings. By virtue of its providing the basis for sustaining life, we take Earth to be a loving planet. Despite hurricanes, fires, explosions, wars, and floods, all capable of destroying living things, we say that Earth is nevertheless a loving planet. The emphasis is on capability, and the ability to sustain life is the essence of a loving planet.

Now, what is the range of this analysis? The presence of a planet that could support life becomes the basis for saying that a particular planetary system is a loving planetary system—this despite the possibility that other planetary bodies in that system, as they are encountered, seem to be incapable of life support (as apparently is the case for our solar system). With respect to galaxies, however, the notion of loving requires community. Would the presence of a single habitable planet provide a basis for claiming that our Milky Way galaxy is a loving galaxy? Absent a general presence of creatures like the ones we know (and love), we consider the galaxy to be nonloving.

Because a loving universe requires the ongoing presence of living and loving creatures (such as the ones we know), the only way we can ensure that there will be a loving universe is for human beings to go beyond Earth, beyond our solar system, out into our galaxy, and eventually out to other galaxies. We may discover that we are not alone in this endeavor—indeed it is highly likely that we are not the only life in our galaxy, let alone the entire universe.⁷ Nonetheless, lacking knowledge of other loving creatures on other planets in other galaxies, it is incumbent upon us, as agents, to transform the universe into a loving universe.

This may seem as fanciful as Magellan’s idea of sailing around the Earth was in the fifteenth century. However, only a century ago we thought that the Milky Way galaxy was the whole universe. The nearest star, the Sun, gives off light that, traveling at the speed of 186,000 miles per second, reaches Earth in about eight minutes. Light from the next nearest star takes about four years to reach Earth. Crossing our galaxy takes a beam of light 100,000 years, and traveling to the edge of the universe takes light 15,000 million years.

Let us suppose that a person is born with a life expectancy of seventy years. That would seem to enclose her in a globe of radius seventy light years, never to live to venture further. However, just about the time we learned the size of our galaxy, we also learned that elapsed time as experienced by a person in motion depends on the speed at which that person is traveling. This remarkable discovery—Einstein’s special theory of relativ-

ity—tells us that we age more slowly when moving at very high speeds and would not age at all were we to travel at the speed of light.

It has been suggested that if we could travel in a rocket ship, constantly speeding up with an acceleration equal to g (the acceleration of gravity at the surface of Earth) for the first half of our journey to the stars and cover the second half slowing down at the same (but opposite) acceleration, we would (1) continue to experience normal gravity and (2) increase the distance we could travel in one lifetime. In this ship, under these conditions of motion, a trip to the center of the galaxy would take a mere twenty years. Continuing to the edge of the universe would take an additional twenty-five years. If we were to live another forty-five years and return to Earth, however, we would not recognize the planet from which we came—because Earth would be 30 billion years older than it was when we left.

It seems that a loving universe may be more accessible than we thought.

WHY DIVINE: PRAYER AND PURPOSEFULNESS

What makes the conjectures “divine”? What evidence is there for the Divine? If the evidence is “insufficient” in terms of formal logic, sense perception, or experiment, is the evidence nonetheless plausible and potentially persuasive?

William James wrote that religious sensibility begins with a sense of unease, a sense that something is not right. The fifth-century Christian bishop of Hippo in northern Africa expressed this unease theologically, in the form of a prayer: “Our hearts are restless, O Lord, until they rest in thee” (Augustine 1997, I, 1 [1]). In Buddhism, ignorance is the cause of craving and of clinging to the *I* of consciousness. Self-conscious students and agents may also be aware that they need help and guidance to create a just and loving universe.

Another example of this kind of self-consciousness can be found in a letter written by Michael Faraday (1791–1867), an English scientist whose “experiments yielded some of the most significant principles and inventions in scientific history” (“Michael Faraday” 1975, 922). His strong religious sensibilities are apparent in the following extracts from a letter he wrote to Edward Barnard on 23 July 1826:

However strong and certain the appearances are to me, if I venture an internal judgment, I am always wrong in something; and the only conclusion that I can come to is, that the end is as beneficial as the means of its attainment are beautiful. . . . In experiments I come to conclusions which, if partly right, are sure to be in part wrong; if I correct by other experiments, I advance a step, my old error is in part diminished, but is always left with a tinge of humanity, evidenced by its imperfection. In affairs of life 'tis the same thoughts; my views of thoughts at a distance and close at hand never correspond, and the way out of a trouble which I desire is never that which really opens before me. . . . Now, . . . in all these, and in all kinds of knowledge and experience, the course is still the same, ever imperfect to us, but terminating in good” (Faraday 1991, Letter 303).

We read reports of this kind of experience as evidence associating the Divine with purposefulness—not in the manner of the cosmological argument for the existence of God and not as Intelligent Design but rather as “conjecture-based”—as conjecture always is, based on insufficient evidence.

What is meant by *divine*? The word serves as adjective, noun, and verb. As adjective, it is an evaluation of a quality of the conjectures and designates the field of meanings to which they belong. As noun, it names the ultimate ground and purpose of the conjectures. Divine also serves as a synecdoche, a gathering up of all the names people through the ages have used for the Divine—names such as Yahweh, God, Allah, the One, I AM WHO I AM, She Who Is, The Merciful, Krishna, El, Sophia, the Word. We agree with theologian Charles Hartshorne (1984) and others that the Divine need not be omnipotent, omniscient, or impervious to suffering. We can imagine the Divine as having a sense of humor and as being surprised. We take notice of extraordinary manifestations of the Divine. We are especially interested in reports of experiences of inspiration and revelation (such as those of Pollack and Bragg cited earlier) that have been understood as gifts of the Divine. We foreground the ways in which human beings interact with the Divine when they pray. And so we refer to the Divine as The One to Whom we pray.

In What Sense Is Prayer Associated with the Divine? Originally *divine* referred to “people who knew more.” The word draws people into the More that is beyond the everyday. The More—what is to be known of the universe, what is to become of it and us as a part of it—evokes something beyond the everyday in human beings.⁸ We think that it evokes the experience of prayer. This experience includes explicitly asking, praising, and wondering or implicitly being aware of a groaning within us when we do not know how to pray.⁹

What are human beings doing when we pray? Insofar as we do more than what all animals do, we experience thoughtfully. Some such experiences are limit experiences, which go beyond the human ability to assimilate and to understand: experiences of love and hate, birth and death, past and future, and (centrally) those of deep uncertainty, especially uncertainty with respect to future moments. At such times we may cry out, even silently, for help. Such cries are prayers.¹⁰ In other circumstances we are overwhelmed by joy, amazement, or love, and we may cry out in thankfulness. Such cries are prayers. The experience of hope, often generated by prayer and without which we could not live, is an experience of The One to Whom we pray.

Prayer is a quintessentially human activity, and to pray is to communicate with the Divine. Prayer is associated with all that is desired, celebrated, thanked for, and sought to be understood. A case can be made that those who engage in these activities are praying even if they do not affirm their own behavior as prayer. People in Alcoholics Anonymous, for example,

express reliance upon a Higher Power even if they claim not to be religious. We think that it is characteristic of human beings to pray, that the act of praying is pervasive. We would not expect to find human beings who have not prayed at one time or another.

Prayer is a form of communication, and an essential aspect of communication is some knowledge, however partial, of the one with whom we are in communication. To reflect self-consciously on The One to Whom we pray is to be theological, just as to reflect on whatever else we know or believe to be the case is to be philosophical. So also to have some knowledge of the world, as distinct from mere experience of the world, requires engagement with natural philosophy.

In What Sense Is Purpose Associated with the Divine? To divine can also mean to foresee the future. When we contemplate the future of planet Earth and that of the universe, we reinforce the meaning of divine as verb. Here, the empathetic relationship between what is human and what is divine comes into play. To empathize is to feel with, to experience in one's self as someone else experiences. And so it is with experience of the Divine, for example, not as designing but as intelligent, hopeful, loving, and purposeful.

We can strive to experience empathetically with Theóne. Some mystics have striven for union with the Divine. We have heard how some scientists find themselves at one with what they are investigating. Jacques Monod, for example, once reported, "Let the attention so concentrate on the imagined experience as to be oblivious to all else, and I know—for it has happened to me—that one may suddenly find oneself identifying with the object itself, with, say a molecule of protein" (Monod 1972, 21). Such empathetic striving evokes a teleological dimension to existence.

Empathy often is confused with sympathy. In sympathizing, one feels sorry for another, usually another person. Empathizing, one becomes the other in imagination. Empathy is not restricted to other persons, not even to other living things. When a large object is placed on a fragile table, one can "feel" the strain of the furniture. Such feelings may be as close as we can come to admitting nonliving things into our affective world. Artistic and poetic license, of course, opens doors to different experiences of nonliving things and legitimizes different claims about them. An empathetic relationship can be effectively modeled by acoustical resonance. If one holds down the sustaining pedal on a piano and sings a musical note, the sound continues to be heard, emanating from the piano strings, after the singer stops. We can say that the piano is empathizing with the singer.

Empathy pertains to why we are the way we are, as well as why we can be purposeful in what we must do. An empathetic relationship, because of its resonant mutuality, provides grounds for both knowing that we must love one another and knowing that we are loved by Theóne. We can thus

divine why we were made in the first place—and not just made, but made *imago Dei*, in the image of God, in the image of The One to Whom we pray. In Hinduism we find scriptures that build a kind of identity: “That is Reality; that is Atman. That art thou” (Brihadaranyaka 1, 4, 10). The mutuality of our empathetic relationship with Theóne undergirds our relation with the world as creators, “created co-creators” (Hefner 1993), and our relationship with others such that “just as you did it to one of the least of these . . . , you did it to me” (Matthew 25:40 NRSV).

With respect to objectivity, we recognize that whatever we are trying to know is always in a process of change—a house, a piece of wetland, a star. This changing aspect of reality is its potency. We realize that whatever we specify something to be (in the laboratory, in our lives, in what we see in the world), it has potential. Things have forms (*Gestalt*, categories, names). Things also are active. They function; they attract our attention, our consciousness. With respect to subjectivity, when we are asking questions about something that we encounter—What is it? How does it work? Where is it? Why is something the case?—we exercise our own potential for purposeful activity.

The Divine Conjectures allow us to frame teleological questions that are different from the more familiar question “What is the evidence of God’s action in the world?” We don’t ask “How is the Divine acting?” but rather “How are we to understand what we have been taught, the knowledge we have been given, the tools we have been inspired to invent?” To the question “What responsibility have human beings for the creation of a loving universe?” we reply with another: “For what do human beings have unique capability?” Some of the most important abilities include:

- the ability to improvise, even to construct, other “worlds”
- the ability to reflect on oneself and to change one’s course (for example, pilot and passengers in an emergency)
- the ability to recreate almost any nonliving thing we care about after it has been lost
- the ability to pray—the gift of communication with the Divine
- the ability to love

The planet that we know—the one that supports us—has made some progress in developing a strong sense of what is needed for it to become loving. There may be some other parts of our galaxy or of other galaxies that have done better. We can imagine some doing worse. And we may be getting closer to the point where we will know better how to contribute to Theóne’s objective of a loving universe. Just as we recognize events from the past that made it possible for us to exist in the present, so too must we foster those events that make it possible for intelligent life to flourish in the future.

NOTES

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1. In his Preface to the second edition of *Conjectures and Refutations*, Popper wrote, "All our knowledge grows *only* through the correcting of our mistakes. . . . Now it appears that in order to apply this method we must already have *some aim*. . . . And our system of aims not only *changes*, but it can also *grow* in a way closely similar to the way in which our knowledge grows" (1965, ix).

2. Here, *true* refers to coherence with what we otherwise know and believe to be the case. See James [1902] 1978, 37.

3. Physicists' claims about the Beginning apply a fraction of a second later, when what happened was more complex than a conversion of pure mass into pure energy.

4. Morowitz continues: "There are those whose philosophic orientation toward the origin of life would have to be modified following the successful synthesis of a living cell. From a point of view of the present paradigm, the low-temperature experiments should already have forced a shift in viewpoint. Within existing molecular biology, the synthesis of a living cell would not occasion any reorientation of theory, whereas the failure to synthesize a living cell when techniques appear to have been adequately developed, would force a reexamination of the physical foundations of biology" (1978, 53).

5. Morris writes: "What we know of evolution suggests [that] . . . convergence is ubiquitous and the constraints of life make the emergence of the various biological properties very probable, if not inevitable. Arguments that the equivalent of *Homo sapiens* cannot appear on some distant planet miss the point: what is at issue is not the precise pathway by which we evolved, but the various and successive likelihoods of the evolutionary steps that culminated in our humanness" (2003, 283–84).

6. See also David Tracy's *On Naming the Present* (1994), 94–106, especially 94–95, where he distinguishes among six kinds of love: *agape, eros, libido, philia, caritas, and nomos*.

7. Although we hold no hope for SETI (Search for Extraterrestrial Intelligence), we do agree with its premise that statistically life elsewhere in the universe is almost a certainty and in our Milky Way galaxy very likely indeed.

8. See Tracy 1975, 92–118, especially 93: "I have come to believe that the concept 'limit' can be used as a key (but not exhaustive) category for describing certain signal characteristics peculiar to any language or experience with a properly religious dimension. Whether that dimension be explicit or implicit is not . . . the central issue."

9. "The Spirit helps us in our weakness; for we do not know how to pray as we ought, but that very Spirit intercedes with sighs too deep for words" (Romans 8:26 NRSV).

10. In "Travail et Parole" (1953), Paul Ricoeur's understanding of the linguistic form *interjection* as the "intersection" between helplessness, or fear, and resistance is a suggestive way of thinking about rudimentary acts of prayer. The term *interjection* is defined (1) as "an ejaculatory utterance usually lacking grammatical connection" or "a word or phrase used in exclamation" [as 'Amazing!' or 'Oh no!'] or (2) as "a cry or inarticulate utterance [as 'Arggggh!'] expressing an emotion" (*Webster's Collegiate Dictionary*). Our patterns of interjections may give us insight into our innermost disposition as we encounter the world.

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