Harry Lee Poe

Communication

Divine Action in the Twenty-First-Century Universe

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When the South Carolina Honors College at the University of South Carolina grew concerned that their students felt they had to choose either their faith or modern science, faculty invited Hal Poe to bring a lecture to help the students think through how God might be able to act in the universe without violating the laws of nature. Poe spoke on September 26, 2017. In his lecture, Poe developed the idea that how science interacts with the laws of nature, suggests how God can interact with a universe governed by such laws of nature.

Many people believe that God cannot be involved in the universe, because that would mean violating the laws of nature. They tend to believe that the universe operates like a great clock, impervious to any outside influence beyond the closed continuum of cause and effect. David Hume, writing in the eighteenth century, defined a miracle as "a violation of the laws of nature." Since a violation of the laws of nature is impossible, then God cannot be involved in the universe.

With his definition, Hume not only affirmed the clockwork universe, but he also defined deity without saying so. The deity that Hume argues cannot violate the laws of nature, is not the God of the Bible, but the God of the philosophers. The intelligentsia of his day had long since forsaken the God of the Bible for the deistic God who set the clock in motion and remained aloof from its operation. The completely self-sufficient clock required no interference—the first self-winding clock. The problem with this view is that the universe of Hume, Aristotle, and Isaac Newton no longer exists.

Harry Lee Poe *holds the Charles Colson Chair of Faith and Culture at Union University. The author of seventeen books on faith and culture, Poe has published four books on science and faith with his colleague Jimmy H. Davis, including* Science and Faith, Designer Universe, Chance or Dance, *and* God and the Cosmos. *A Fellow of the ASA, Poe served on the Executive Council and was president of the ASA in 2014–2015.*

Big Bang Cosmology: Things Happen

Between the work of Edgar Allan Poe, George Lemaître, and Edwin Hubble, the big bang theory has become the commonly accepted cosmology of the scientific community. When Poe first proposed the big bang theory in 1848, the scientific community still lived in the universe of Aristotle, a universe of eternal duration. Hume proposed that with infinite time, an infinite number of possibilities could occur by accident, and that life was one such accident. The big bang universe, however, has not had so much time for accidents. It had to get it right the first time. This fact may merely mean that we lucked out. In terms of our topic, however, the most fascinating thing to me about the big bang universe is that it does things. Clocks are just static machines that turn. Instead of the static clock of Aristotle and Newton, the big bang universe does things that have never happened before.

The laws of nature did not cause the big bang universe. Instead, the universe produces the laws of nature. We should recall that the laws of nature are what Captain Barbossa of *Pirates of the Caribbean* would call "more guidelines than rules." The laws do not constrain nature, but rather they describe the

behavior of nature. The laws of nature are more an effect than a cause, the result of the interaction of the fundamental forces. This dynamic interaction makes a universe quite different from that in which Aristotle and Newton lived. The old universe was a closed, hermetically sealed universe in which every event was determined and could be predicted with absolute certainty. Until the twentieth century, modern science nostalgically clung to Aristotle's universe, probably because scientific experimentation often takes place in a hermetically sealed environment that we call the laboratory. There, efforts are made to "control" everything except a specific variable. In the universe in which we actually live and the forces of nature operate, everything is variable. In a special sense, everything is out of control.

Carl Sagan once remarked, "The universe is a pretty big place. If it's just us, seems like an awful waste of space." Others have made similar comments aimed at refuting the idea of God based on the vastness of the universe. It is not really an argument, but a pondering about the place of humanity in a vast universe. It was the same pondering of King David some 3,000 years ago when he wondered,

> When I consider thy heavens, the work of thy fingers, the moon and the stars, which thou hast ordained;
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> What is man, that thou art mindful of him? and the son of man, that thou visitest him? (Ps. 8:3–4, KJV)

It is not a scientific question, but an existential, philosophical question. It is a question that works in Aristotle's universe of infinite time and space, but not in our universe. In our universe, we look at the heavens and do not see simply vast space, but also vast time, for time and space are one.

When Edgar Allan Poe first described what we call the "theory of relativity," he did not use the word *time*, but *duration*, because our culture has so much baggage connected with the word "time." Our universe needs time as much as it needs space, and in our universe, it takes around ten billion years to establish conditions necessary for life. In the early life of the universe, its nature and laws changed several times within the first minute. From our perspective, it was only a flash in the pan of time, but from the perspective of the events themselves, each new episode involved the entire history of the universe from its very beginning up to that point—eons of time.

To have life, we first needed matter. To get matter, we had to have atoms which required nuclei which required particles. Before any of that could happen, the universe had to have enough room for things to move around so anything could happen. At first, everything existed as a great realm of opaque plasma, but as space expanded, the universe continued to cool and condense into neutral atoms, and the universe became transparent. With the advantage of time and space, gravity had room to draw atoms together into massive spheres whose fusion resulted in combustion to form the first generation of stars. These stars became the great furnaces that produced the 94 elements in nature. At the end of their lives of a few billion years, the stars exploded and their matter was flung out to re-form into second-generation stars with solar systems. The elements of the star dust that formed Earth became the stuff of life. It takes time and space for life.

The big bang has resulted in an open, indeterminate universe in which unforeseen things that never happened before can suddenly happen without prediction. Looking backward from the new event, however, every step that led to the event can be described as consistent with the fundamental forces and their laws.

Chaos Theory: Unexpected Things Happen

Meteorologists produced a number of models in 2017 for how Hurricane Harvey might behave. They could not say with any certainty what would happen except that a lot of rain would fall. Looking back on the event, however, meteorologists can explain why Harvey behaved the way it did. Then, the nation spent hours before the TV as meteorologists presented multiple models of what path Hurricane Irma might take. The weather is an example of what physicists call "chaos theory." Chaos theory is sometimes called the "butterfly effect" with the explanation that if a butterfly flaps its wings in equatorial Africa, then a category five hurricane will wipe out Barbuda. It is actually more complicated than that. If a butterfly flaps its wings in equatorial Africa, the price of gas will go up fifty cents a gallon in Texas. When Edgar Allan Poe first proposed chaos theory in 1848, he argued that every particle of the universe exerts attraction and repulsion on every other particle of the universe.

The laws of nature are all working, but that is what makes prediction difficult—too many variables. The laws of nature interact like one massive game of "rock, paper, scissors." Put another way, one law seems to "trump" another law, but it is not a case of the suspension of a law of nature. Rather, it is the result of the interaction of multiple laws of nature with sometimes surprising results.

Quantum Theory: Seemingly Contradictory Things Happen

Quantum theory deals with the behavior of the subatomic world. Imagine Earth traveling in its orbit at some 93 million miles from the sun, when suddenly it jumps to the orbital path of Mars some 142 million miles from the sun. Furthermore, imagine Earth changing orbital paths without actually traveling from one path to the other. Electrons behave this way. This movement of electrons from one orbital path around the nuclei of atoms to another orbital path is called a quantum leap. The quantum world is very peculiar if you think our world is the standard. It defies the received logic of Aristotle.

To make matters more interesting, if you try to locate the position of an electron, you cannot measure its velocity, but if you measure its velocity, you cannot locate its position. The act of measuring affects the outcome of the experiment. The electron behaves like a particle—a discreet, limited, finite entity—when you want to find its location. If, on the other hand, you want to know its velocity, it behaves like a wave—extended, infinite, unbounded. It can express both the characteristics of a particle and a wave—two apparently mutually exclusive entities. According to the Law of Noncontradiction, Aristotle teaches us that a thing cannot be X and not-X at the same time; therefore, electrons do not exist … or Aristotle is wrong again.

Genetic Theory: Matter Makes Copies of Itself

Our DNA does not determine who we are so much as it determines the possibilities for whom we may become. Every organism is encoded at conception with a complete blue print. Every cell of the body contains a complete set of directions, which might seem excessively redundant, but it comes in handy. The DNA not only contains the code, it also reads the code and directs the cell to do what the directions say in the proper sequence. When one male cell and one female cell come together at conception, the DNA strands of each cell unzip like the zipper on a jacket, and half the female strand zips itself onto half the male strand. This has been going on for about 4 billion years.

As it turns out, the DNA process is anything but deterministic. Pediatricians tell pregnant women not to drink alcohol, take drugs, or smoke during pregnancy. We are told to avoid radioactive contamination and carcinogens. DNA is subject to rock and roll. Bits of data can be damaged, destroyed, or dislocated; this results in a slight or major change in an organism from parent to child. Over time, these changes mount up and you can end up with something that looks and behaves absolutely nothing like its distant ancestors.

A Porous Universe: The Control Panel Is Always Open

At every organizational level, the physical universe is indeterminate and open. The universe is open to influence by itself, and we are part of it. Science and technology exist because we live in a universe that invites interference with its most basic forces and laws of behavior. We live in a universe in which we can manipulate, violate, contravene, and interfere with nature and its course. We can interject our will into almost every imaginable situation. The alteration of the course of nature is the history of human culture from the time when we first realized that we could control the behavior of fire to the time we realized that we could control the behavior of atoms and cause them to do what they would not naturally do.

We violate the way that nature normally behaves, as when Thomas Edison found a way to capture lightning in a jar, and caused it to go where he wanted it to go, when he wanted it to go there, and in the degree to which he decided to make it go. My cousin violated the way light behaves in nature when he amplified it with stimulation by emissions of radiation to create the laser. Yet, we have not really violated nature. Nature is as open as the control panel on any electronic device because the laws form the openness. Genetic engineering and atomic acceleration tell us that we live in a universe in which intelligence can alter or change what would

normally happen in nature. Humans learned how to violate gravity only because fast-moving air creates less pressure. Rock breaks scissors. Scissors cut paper. Paper covers rock. The laws are more guidelines than rules.

The possibility of laboratory science tells us something else about our universe. It is possible to suspend the effects of chaos theory locally. The purpose of a laboratory is to prevent contamination of an experiment by forces outside the control of the experimenter. While humans cannot control for all forces, we have had remarkable success at limiting the extent to which the variables of which we are aware might interact with the matter under investigation. Thus, we can cause something to happen locally that does not have an effect on the environment around it. We know how to manipulate a deadly infectious pathogen without killing the biologists who study it or setting off a global pandemic that wipes out all human life on earth. We can create a nuclear reaction that would not normally occur in nature; we can then use it to destroy a city, or, by controlling the reaction locally, we can provide electric energy to that same city.

We live in a porous universe that allows for intelligent intervention, interference with the processes of nature, and violation of the normal course of events. Not only does the universe allow—nay, invite—such interaction, it does so without disrupting the normal course of events in the processes of nature beyond intelligent intervention. The fact of science and technology is the smoking gun that tells us that Divine action does not contradict a universe characterized by orderly processes that we can predict and affect with a high degree of accuracy.

The God Who Is Involved with the Universe

I have not been arguing for the existence of God. I have merely been discussing an issue that confuses people about God, if God exists. Given the kind of universe that modern science believes we have, we can make a few modest observations. If God exists, then God has at least as much freedom as humans have to interact with the universe.

A second observation involves the nature of God. I have been speaking from a Christian perspective that conceives of God in three persons: God as the Ancient of Days who exists eternally outside of time and space, for whom duration is an unrelated concept; God as the Eternal *Logos* who creates the physical universe and then partakes of physical existence; God as the Holy Spirit who is present throughout all of time and space simultaneously. This kind of God cannot suddenly intervene in the universe, because this God has always been involved with it. This God has never been absent or withdrawn or uninvolved with the universe.

Other religions have alternative conceptions of deity, each with its own set of issues when it comes to modern science. The issues are different for each religion, and we do well to remember that the word God means different things to different people. In Islam, God is wholly other. In Hinduism, God is the whole and the world is the body of God. In Buddhism, the world is an illusion and God is the reality. The difficulty of the Christian notion of God as three persons is that it embraces all three of these conceptions of deity at once, as to who God is, without being polytheistic. It was a difficult trick to pull off in Aristotle's universe, but in our new universe in which we realize that an electron is both a wave and a particle, perhaps this understanding of God as trinity, now makes more sense. ✧