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Random Thoughts on Random Events

RON PRATT

In life, we are constantly bombarded with a never ending onslaught of random and seemingly mindless events. The rain falls on the just and the unjust. A tornado sweeping across the plains of Oklahoma may devastate a community. Or not. And the inconsequential speak loudly, too. Exactly three dead leaves are on my car as I leave the parking lot. No more, no less and it makes me think: why three? These random events can be most trying to our faith as we struggle to see the sovereignty of a loving and just God intimately involved in our affairs. Modern science, largely emerging in the late 19th and 20th centuries, gives us fascinating insight into random events, challenging our ontological foundations and perhaps giving us the slightest glimpse into the mind of God. Like the proverbial ant traversing the stretching rope, we find that science gives us new knowledge and insight, but at the same time creates even more mysteries which make total understanding seem even further away. But our ant does reach her goal, even though it takes her a long, long time.

Since the dawn of human history, people have experienced what might be called early morning angst, a time when that all-pervasive and unwelcome background anxiety, so aptly illustrated in Edvard Munch's *The Scream*, seems to intensify and cause sleep to flee. We are awakened in the predawn hours with concerns ranging from legitimate worries and trivial concerns to the downright ridiculous. Sleep may evade us as we fret that water is just too wet or that there are just too many grains of sand on the beach to ever be swept away.

The Walrus and the Carpenter
Were walking close at hand;
They wept like anything to see
Such quantities of sand:
“If this were only cleared away,”
They said, “it would be grand!”
“If seven maids with seven mops
Swept it for half a year.
Do you suppose,” the Walrus said,
“That they could get it clear?”
“I doubt it,” said the Carpenter,
And shed a bitter tear.¹

Old English has a word for this: *uhtceare*. The meaning is “morning cares,” which awake us from peaceful slumber and hold us in the bondage of insomnia until the new day beckons us to arise.

When experiencing *uhtceare*, it often involves agitation over an endless succession of meaningless and inconsequential events. A foreboding doubt begins to creep up from the mind’s darkest regions, which opposes my long-trenched and Christ-centered world view. The angst is not that I might find out someday that the Moslems were right after all, and that I should have been reading the Quran. It is not that I should have continued my now long-ceased pursuit of Buddhism. It is that in the end, I discover that it really was all about nothing. That it was all just a random interaction of time, space, matter, and energy, from nothing, for nothing, meaning nothing. Sound and fury, signifying nothing. A fear that there really is no cosmic or moral difference between kicking a can down the road or kicking a baby against the wall. It’s discovering that Richard Dawkins was right. (Of course, if Richard Dawkins is right, I will never know.)

We have long been fascinated by random or stochastic events, and this largely in two different realms: sortilege or divination, and games of chance. Lloyd Montzingo points out how curious it is that the same person under one roof interprets the casting of lots as being directed by God or the gods, and under another roof the casting of dice as being totally random and a game against whose outcome a wager may be made.² We, of course, recall the casting of lots by the disciples to find God’s replacement for Judas Iscariot, and we may ponder over John Wesley’s casting of lots to determine whether or not to publically challenge George Whitfield’s stand on election and predestination.³ Traditionally, the church has interpreted random events as being totally under the sovereignty of God. How might this be true? And why would it be such? Does God really play with dice to the consternation of Albert Einstein? As distressing as it is, we might have to say yes. Let us look at some historical background.

We see endless references in Scripture where seemingly random events have shaped history. For example, that Abraham’s sacrifice was provided by a ram which happened to have its horns caught in the thicket; that the Ishmaelites happened to find Joseph in the well; that Vashti’s insolence allowed a Hebrew woman to become queen of Persia and Media; and that David had a

real lucky shot in downing Goliath (which would make Dennis the Menace envious). The early church, as we see in the words of Augustine, has viewed God as totally sovereign over random events: “Nothing in our lives happens haphazardly, everything that takes place against our will can only come from God’s will, his Providence, the order he has created, the permission he gives, and the laws he has established.”⁴ We see the same much later in the Heidelberg Catechism:

The almighty, everywhere-present power of God whereby, as it were by His hand, He still upholds heaven and earth with all creatures, and so governs them that herbs and grass, rain and drought, fruitful and barren years, meat and drink, health and sickness, riches and poverty, indeed, all things come not by chance, but by His fatherly hand.⁵

And in John Calvin’s *Institutes*: “We must consider that the Providence of God, as taught in scripture, is opposed to fortune and fortuitous causes.”⁶

With the coming of the Age of Reason, the Copernican Revolution, and the pioneering work of Isaac Newton, the progressive and enlightened saw this traditional view as an anachronism. With the advent of Newtonian mechanics, along with the most powerful analytic tool of the time, the calculus, random events were nothing more than an illusion. This new way of interpreting the universe is best summed up by the great mathematician and analyst, Pierre Simon Laplace.

Given for an instant an intelligence which could comprehend all the forces by which nature is animated and the respective situation of the beings who compose it – an intelligence sufficiently vast to submit these data to analysis – it would embrace in the same formula the movements of the greatest bodies of the universe and those of the lightest atoms; for it, nothing would be uncertain and the future, as the past, would be present to its eyes.⁷

We now had a universe which ran by itself. There were no random events, and everything was determined by a set of initial conditions and forces acting on every object within the universe. Free will was only an illusion. My choice

in selecting Colgate toothpaste at Target the other day was not random, but followed logically and inevitably from equations of motion, which, given a sufficiently powerful computer, could have been solved and predicted my choice hundreds, thousands, or even billions of years ago. God, if He existed, was only a God of the Gaps, and those gaps had now shrunk to zero. God was out of the picture entirely, except as a blind watchmaker.

This smug and deterministic world view was turned on its head with the advent of the “New Physics” or Modern Physics of the mid to late 19th century. How boldly this contrasts with the Laplacian formulation! Albert Einstein sums it up beautifully: “As far as the laws of mathematics refer to reality, they are not certain, and as far as they are certain, they do not refer to reality.”⁸ The New Physics reintroduced random events front-and-center to the world stage. Einstein’s theories of specific and general relativity were disturbing enough, destroying our self-existent absolutes of space and time, predicting the existence of black holes which by definition do not exist, and suggesting that gravity is time and space curved in some higher dimension. But the most shocking ideas came from the new vista of quantum mechanics.

Quantum mechanics supposes that energy does not present itself in a continuum of values, but comes in little bundles, or quanta. Any amount of energy can be measured in integral numbers of these bundles. You can have any number of these bundles, as long as that number is an integer. One of the basic equations which illustrates this idea comes from solving the Schrödinger wave equation for the simple harmonic oscillator. It is one of few configurations which can be solved exactly. It yields the solution:

$$E_n = \frac{h}{2\pi} \sqrt{\frac{k}{\mu}} \left(n + \frac{1}{2} \right) \text{ where } n = 0, 1, 2, \dots$$

The quantities h and k are just physical and known constants, but notice that the energy is quantized where n is constrained to be an integer. The lowest energy state of the harmonic oscillator is of course when n is at its lowest allowed value, $n = 0$. But you can see that even at the lowest energy state, E_0 is not zero but some finite quantity. So at the atomic level, zero energy is impossible. This shocking prediction is encapsulated in the Heisenberg Uncertainty Principle, which states that you cannot know both the position and velocity of a small particle with unbounded precision. The more you know of one, the less you

will know of the other. It is a tradeoff. So a small particle can never be totally at rest! If it was, you could say, “there it is!” and you could also say, “it is not moving!” violating the uncertainty principle.

Therefore, random motions are built into nature. One can only use Schrödinger’s solution to calculate the probability of finding a small particle in a certain location in space at a certain time. God does play with dice. William Pollard writes:

Whether we like it or not, it seems to be a world in which indeterminacy, alternative, and chance are real aspects of the fundamental nature of things, and not merely the consequence of our inadequate and provisional understanding.⁹

This matter-in-motion view of the world at its most basic level made not only random motion and random events an integral part of the universe (no pun intended), but also had profound influence on social and political theories of the time. Two of the most notable of these include the Marxian notion of dialectics and synthesis, and the Maoist concept of perpetual revolution and class struggle, which culminated in great 20th century debacles such as China’s Great Proletarian Cultural Revolution, and the agrarian utopia sought by the Khmer Rouge.¹⁰

Roughly concomitant with the New Physics of relativity and quantum mechanics was the development of the steam engine and a sudden new and practical interest in the conversion of heat into work. This gave birth to thermodynamics, the study of the motion of heat. It is thermodynamics that reveals the menacing nature of random events. Thermodynamics is linked to Heisenberg’s Uncertainty Principle by postulating that absolute zero (no motion) is unattainable. However, thermodynamics also defines a new engineering quantity, entropy, which is a measure of disorder. Entropy, according to the Second Law of Thermodynamics, is always increasing for the universe. So now, not only do random events occur, but when they occur, they increase the total disorder, or chaos of the universe.

We know this from experience to be true. A tornado sweeps through a town and leaves chaos in its wake. We would not expect the tornado to sweep through a lumberyard and leave behind a lovely, Second Empire mansion, ready to

move in to. There are far more ways for the atoms and molecules of the town to be configured in disorder than in order. All it takes is a random change introduced to the system and entropy increases.

What is God's role in all of this? Should we really be wishing our friends "good luck?" A few hours of uhtceare provide some thoughts but no answers. It seems appropriate to reject an oft-held view where God, existing in space and time, decrees "I am going to create a universe now," and then does it. After bestowing free will upon mankind, he then watches to see what happens and responds accordingly from his heavenly vantage point. Among those who adhere to this view, some say God can, at least sometimes, look into the future and know what is going to happen, others say he cannot. Some even say that God Himself is evolving in character and stature as this experiment unfolds, like a boy who learns responsibility and compassion as he takes care of his ant farm.

I instead adopt an older view dating back to Augustine and before, which views time and space as creations of an immutable and sovereign God but in no sense containing God.¹¹ Modern discoveries in cosmology hint at this viewpoint as well, since the Big Bang is a creation event in which time, space, matter, and energy became realities. In fact, the mass and energy content of the universe appears to be comprised of invisible matter (25%), the energy of empty space (70%), leaving only 5% comprised of galaxies, stars, planets, trees, peanut butter, fingernail clippings, and other kinds of normal matter.¹² The empty universe seems to be an elaborate, created structure for God to put things, as though it were something like a deluxe, Home Depot gambrel-roofed Tuff Shed, containing only a sledgehammer, a couple of shovels, and maybe a rake. Most of the mass is the factory-created shed itself.

I also believe that it is very reasonable that God would have us in a universe that does not compel us out of logical necessity to either accept Him or deny Him. We can make either choice without violating our rational minds and intellect and God leaves room for "reasonable nonbelief."¹³ What better way to do this than to instigate a degree of stochasticity within Creation? Can God, in His sovereignty, choose that regions of time and space be outside His direct sovereignty? This is another version of the nonsensical "can God create a rock so big He can't lift it" question. But I would answer in the affirmative. Yes, He can. How else can it be God's will that there be a situation where God

wills us to pray that God's will be done on earth as it is in Heaven (because apparently it isn't)? It can be God's will that His will is not done.

Was it God's will or simply dumb luck that the man was robbed, beaten, and left for dead at the side of the road (Luke 10)? It was also ordained by God that the Samaritan pass by and render aid to the victim. The Good Samaritan was praised for his compassion and not chastised for interfering in God's plan. It is difficult to maintain the sovereignty of God over random events and not make God either impotent or a partaker of evil, but in my opinion it must be done. R. C. Sproul addresses the issue of evil in a lucid and disturbing statement: "Evil is not good, but it is good that there is evil."¹⁴ Can anyone say "amen" to that? That is difficult teaching. I affirm it to be true, but not with much enthusiasm.

Why, in the Gospel of John, was the man born blind? Jesus said that it was so God could be glorified. Many folks find this answer both intellectually and spiritually unsatisfying. Perhaps the reason could also be explained that there was a random aberration in the pairing of DNA, and consequently something as spectacularly and beautifully ordered as a functioning human eye can be rendered useless by even the smallest random change, like a house of cards collapsing due to a small puff of air.

What about all the little things? These don't make us question God's goodness, but they do make us say, "Come, now! Be serious my friend!" My elbow just bumped a notebook which set a green whiteboard marker in motion which then rolled a few inches and fell to the floor. Did God ordain this event "from the foundation of the world," along with sending His Son to die for man's sins and providing Abraham's ram? Why would He even bother messing around with my marker? But what if He hadn't? What would have been the outcome then? The event happened, so God must have willed it—and the event could not have been a surprise for God. Let us say that I play a little game where I drop a coin off the desk onto the floor. Sometimes the coin lands heads up and sometimes it does not. Is God personally determining the outcome of each event? A scientist would say the outcome is being determined stochastically by the random motions of billions upon billions of air molecules and metal atoms moving hundreds of miles per hour between interatomic collisions, rendering the outcome totally unpredictable. Am I communing with the almighty, playing a back and forth game of "catch" in a sense?

I affirm, without complete knowledge or understanding, that God is sovereign over even the smallest quantum event:

We conclude, then, that God is indeed a “micromanager,” if we must use that term. He is not merely a “micromanager,” who controls microscopic events in individual living cells in our bodies, but a nanomanager, a zepto-manager, who controls events far more minute than what we can observe even through a microscope.¹⁵

And even a bolder declaration: “Though chance and providence appear to be contradictory, random events are indeed a vehicle through which God’s providence can manifest itself.”¹⁶

I said that the outcome of my experiment with the coin was totally unpredictable. But it is also totally predicable. It will be heads or tails. The coin will not shoot off into space or disappear into thin air or change into an apple. Random behavior, like Satan in the Book of Job, operates within strict and narrow boundaries defined by God. Yes, there is a devil, but he is God’s devil. Yes, there is randomness, but it is God’s randomness. Not one atom in the universe goes rogue and leaves the total dominion of God. Only God can ordain perfect randomness, and it is inextricably woven into the fabric of the universe. Only God can generate a truly random number.

NOTES

- ¹ Charles Lutwidge Dodgson, *Through the Looking-Glass and What Alice Found There*, Independent Publishing, 2013.
- ² Lloyd Montzingo, *Random Variables and a Sovereign God*, J. of the ACMS, Inaugural Issue, 2004.
- ³ Whitefield’s Letter to Wesley, December 24, 1740, Public Domain.
- ⁴ Augustine, *Enarrationes in Psalmos* (Narrations on the Psalms), 118 vs 12, Public Domain.
- ⁵ The Heidelberg Catechism, 450th Anniversary Edition, The Reformed Church in the United States, 2013.
- ⁶ John Calvin, *The Institutes of the Christian Religion*, Chapter 16, Sec. 2. Christian Classics Ethereal Library, p. 170, 2015.
- ⁷ Pierre-Simon Marquis de Laplace, *A Philosophical Essay on Probabilities*, Cosimo, 2007.
- ⁸ John F. Kiley, *Einstein and Aquinas, a Rapprochement*, Martinus Nijhoff, 1969.
- ⁹ W. G. Pollard, *Chance and Providence -- God’s Action in a World Governed by Scientific Law*, Bibliobazaar, 2015.
- ¹⁰ Mao Ze Dong, *Newest Guide*, Victory Smelting, 1969.
- ¹¹ Saint Augustine, *Confessions*, Oxford University Press, 1991.
- ¹² Michio Kaku, *Parallel Worlds – A Journey Through Creation, Higher Dimensions, and the Future of the Cosmos*, Anchor Books, 2005.

- ¹³ C. S. Evans, *Natural Signs and Knowledge of God – A New Look at Theistic Arguments*, Oxford University Press, 2012.
- ¹⁴ R. C. Sproul, *Truths we Confess – A Layman’s Guide to the Westminster Confession of Faith*, Vol 1, *The Triune God*, P&R Publishing, 2006.
- ¹⁵ V. S. Poythress, *Chance and the Sovereignty of God – A God-Centered Approach to Probability and Random Events*, Crossway Publishers, 2014.
- ¹⁶ W. G. Pollard, *Chance and Providence Gods Action in a World Governed by Scientific Law*, Bibliobazaar, 2015.