Victor J. Stenger, *Quantum Gods: Creation, Chaos, and the Search for Cosmic Consciousness* (Amherst, NY: Prometheus Books, 2009), 292 pp., $26.98 (cloth), ISBN: 978-1-59102-713-3. Review doi: 10.1558/jsrnc.v5i3.373.

Victor Stenger, professor emeritus of physics and astronomy at the University of Hawaii and currently adjunct professor of philosophy at the University of Colorado, has spent a good deal of time examining evidence for the existence of God. In his earlier book, *God: The Failed Hypothesis* (2008), Stenger argued that the overwhelming lack of any solid evidence pointing to the world-engaging activity of 'the traditional Judeo-Christian-Islamic God' (i.e., the God who allegedly breaks the laws of nature by doing all those supernatural things mentioned in the Bible and the Qur'an) can rightfully be counted as evidence of absence. Even if the default posture of science is to assume that there are no such things as supernatural events, it should be able to detect them if and when they do occur. Since no allegedly supernatural event has ever been scientifically confirmed *qua* supernatural event, science has effectively established the nonexistence of God beyond any reasonable doubt. In *Quantum Gods*, Stenger sets his sights on two alternative views of divinity that are ostensibly friendlier to, and more appreciative of, modern science: New Age quantum spirituality and Christian quantum theology.

According to Stenger, today's quantum spiritualists, such as the producers of the documentary film *What the #$*! Do We Know!?* (2004), abuse quantum theory when they force it to underwrite the view that human consciousness is capable of making its own reality. Yes, the repeated empirical successes of quantum theory have led to some rather startling discoveries: a particle's position and momentum are always uncertain to some extent, particles act like waves and waves act like particles, and two entangled particles behave as if they were only one. But physicists, Stenger assures us, are underwhelmed by the theory's predictive successes: 'Quantum mechanics has passed yet another empirical test. Ho hum' (p. 127). Most importantly, nothing in the theory allows us to determine the outcome of an individual quantum event, let alone tomorrow's weather. In fact, according to the standard interpretation (accepted by Stenger), quantum theory points to the opposite conclusion. At the level of individual events, randomness reigns: there is no telling let alone controlling, for example, when a particular radioactive atom of lead (^{214}Pb) will become an atom of bismuth (^{214}Bi) through the emission of an electron and an anti-neutrino. This kind of thing just happens every so often to individual ^{214}Pb atoms. On the other hand, at the level of many quantum events—say a fist-sized lump of ^{214}Pb spitting out electrons and anti-neutrinos—such randomness gives way to a statistical form of determinism: we can say with utmost confidence when half the ^{214}Pb atoms in our lump will have changed into ^{214}Bi atoms (answer: 26.8 minutes). Stenger is right: quantum theory does nothing to warrant the claim that the future can be controlled for personal gain by meditating on desired scenarios.

Quantum theologians appear to fare no better against Stenger's attack. Focusing on the work of scholars involved in the multi-disciplinary Divine Action Project co-sponsored by the Center for Theology and the Natural Sciences (CTNS) and the Vatican Observatory from 1988 to 2008, Stenger concludes that their God must either cede the evolution of life and the cosmos entirely to randomness, or determine some or all quantum events in order to make sure that the process stays headed in the right direction. If the former, then God sets the world in motion with a single roll of the

dice—an option Stenger dismisses as deism for a quantum age. If the latter, then God intervenes at least occasionally in natural processes but in a way that is hidden from scientific assessment. But intervention, as Stenger points out, is exactly what the quantum theologians profess to avoid! It is important to note in this regard, though Stenger never does, that the question of whether to characterize the divine determination of apparently 'random' quantum events as intervention into the natural order or abrogation of physical law was the subject of much debate throughout the two-decade-long project. The issue is significantly more subtle than Stenger cares to acknowledge. In any case, he finally dismisses the Divine Action Project for failing to maintain sufficient continuity with the Abrahamic view of a God whose activity in the world he presumes ought to make a straightforward, detectable difference.

Although Stenger rejects the metaphysically speculative character of quantum theology, he relies throughout the book upon a number of nontrivial metaphysical interpretations of key points in modern physics (e.g., the past-present-future direction of time is an illusion, quantum randomness is real). He even concludes with an intriguing account of the origin of the law-like behavior of the universe (a metaphysical view he calls 'nothingism'), rebuffing possible critics who might want to argue that his view goes beyond mainstream physics with the following words: 'Nothing I have said conflicts with existing physics… All I have done is give an unconventional *philosophical* interpretation to otherwise well-established theory' (p. 260, italics original). So apparently Stenger sees the point of constructing a metaphysical world-interpretation that goes beyond what empirical evidence can warrant.

Why such disdain, then, for a theistic metaphysics that attempts to move beyond bald supernaturalism into a more respectful and constructive relationship with modern science? Although Stenger purports to nail the quantum theologians for incoherently embracing the very interventionism they want to avoid, the lack of serious analysis in the book (this section consists mainly of extended quotes drawn from online summaries posted at the CTNS website along with brief and often glib commentaries by Stenger) suggests a different motive. His contempt appears to be fueled by the myth, regrettably prevalent among today's atheists, that only the most uninformed, anti-intellectual expressions of religious belief ought to be counted as authentic. Consider Stenger's claim that the quantum theologians have more or less abandoned their traditions by attempting to engage and interpret the sciences in more subtle ways (p. 211). If religion is by definition only bald supernaturalism and obscurantism, then reframing and reinterpreting religious claims in conversation with the sciences becomes, conveniently for Stenger's argument, the act of a traitor.

Distracted by his own emphasis on evidence and dismissive of all things religious, Stenger fails to see a key point of congruence between his own interpretative, metaphysical approach to physics and the quantum theologians' agenda. They, too, wish to avoid saying anything that conflicts with physics and instead want to offer their own metaphysical (in this case, theological) interpretations of otherwise well-established scientific theories. Notwithstanding their clearly divergent assumptions about God's existence and the meaning and value of 'religious belief', both Stenger and the quantum theologians want to push current thinking in the direction of a more interesting and nuanced debate over the supra-scientific interpretive frameworks we construct in order to make sense of our lives. Some, like the quantum theologians, find meaning and value in religion, and yet want to embrace all that science offers. Others, like Stenger, find meaning and value in science, and yet want to pursue questions

beyond those that can be settled by empirical evidence. Nothingism and theism (and many other metaphysical perspectives besides) offer interpretive readings of the world, and each draws heavily on extra-scientific considerations for support. Ultimately, what is at stake in Stenger's critique is not the logic of justifying one's beliefs in the face of the empirical evidence, but rather the craft of responsibly interpreting the world—its meaning and value—in light of everything we and those around us experience.

In this regard, Stenger ought to consider more thoroughly the profound metaphysical implications lurking within the quantum revolution. By his own admission, quantum theory 'involves phenomena that defy common sense and threaten to overthrow the traditional reductionist methodology of sciences, ranging from physics to medicine in which the subject matter is broken down into parts that can be treated independently' (p. 175). Quantum theory 'seems to involve a special place for the human mind in controlling the very nature of reality and doing this instantaneously over the entire universe and back in time as far as time is measured' (p. 175)—an amusing comment, given how closely it echoes the spiritualists' sentiments. Stenger notes that even John Archibald Wheeler and Albert Einstein, no lightweights in the world of twentieth-century physics, puzzled over the seemingly self-relational and holistic character of the universe (pp. 107 and 193, respectively). His discussion of Einstein's famous paper, co-written with Boris Podolsky and Nathan Rosen (the so-called 1935 'EPR thought experiment'), grants that two quantum-entangled photons are actually 'one inseparable whole' with 'no parts that can signal each other' (p. 126). Later, Stenger argues that Richard Feynman's time-reversed view of particle interactions within quantum theory reveals that all elementary particles of a given type in the world are actually the very same particle (pp. 203-206). Do the physicists who have discovered and study these things really find them underwhelming? Hardly.

Stenger knows, and more importantly feels, the bizarre nature of the world that has been revealed by quantum theory, but he is so intent on downplaying its metaphysical implications for the sake of not giving ammunition to religious 'weirdos'—and scoring one for the atheist team—that he misses (at times he even seems bent on preempting) the possibility of a more disciplined conversation about how the world is put together, one that would pay careful attention to the sciences even as it went beyond the boundaries of their expertise. Stenger is a stridently unsympathetic interpreter of religious practice and belief, but he does appreciate the difference between misreading science, and reading science in ways that go beyond it for the sake of fuller understanding. *Quantum Gods* is a fun and instructive read—it is Stenger at his best—but it begs for a sequel that sets aside the desire to ridicule for the sake of addressing the more important and difficult challenge of discerning the metaphysical implications of the quantum revolution for theists, atheists, and nontheists alike. Here's hoping that Stenger will proudly don his new philosopher's hat at the University of Colorado and fully embrace the adventurous spirit of the philosopher-physicist who cares not only whether the equations work, but also what their predictive power says about the world in which we live, move, and have our being.

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