

PREFACE

The content of my previous book, *God: The Failed Hypothesis*, was encapsulated in its subtitle: *How Science Shows That God Does Not Exist*. In that book I tried to be very clear that I was not talking about every conceivable god, just the God with a capital “G.” This is a God who not only created the universe but continues to play a central role in its operation and, most importantly, in the lives of humans for whom he has reserved a special place in the scheme of things.

I used the traditional Judeo-Christian-Islamic God as understood by the great mass of his worshippers rather than a handful of theologians and apologists as my model. This is a personal God who intervenes regularly in the workings of the world and in the lives of humans, performing miracles such as seeing that a certain favorite survives a plane crash or a wartime bomb misses a cathedral. This God is responsible for every leaf falling to the ground and listens to every human thought.

I argued that the actions of such a God in the physical world should surely be detectable by both the human senses and the scientific instruments that extend the range of those senses. Using the scientific method of hypothesis testing, I provided evidence beyond a reasonable doubt falsifying such a God. In doing so I independently confirmed the conclusion of many philosophers that a God with certain attributes, in particular omnibenevolence, omnipotence, and omniscience, is logically impossible given the world, as we know it.

I am not finished. Other conceivable gods can be imagined whose attributes also lend their actions to be examined under the light of reason and science. Furthermore, even among those who hold no belief in a personalized supreme being we find the widespread conviction that “there has to be something out there” beyond the material universe. Surely everything, they say, especially life and humanity, cannot simply be particles moving around in empty space. The great majority even in nations less religious than America believes there must be more to the universe than matter.

I will focus on two concepts of realities thought to lie out there beyond the material world of science that at the same time are based ostensibly on scientific principles—specifically quantum mechanics. Quantum mechanics is the early twentieth century theory of matter and light whose development enabled physics to move from the familiar, commonplace “macro” world described by Newtonian mechanics into the mysterious, exotic atomic and subatomic “micro” world that lies beneath.

The first concept, which I term *quantum spirituality*, asserts that quantum mechanics has provided us with a connection between the human mind and the cosmos. The second concept, which I term *quantum theology*, argues that quantum mechanics and chaos theory provide a place for God to act in the world without violating his own natural laws.

Dealing with phenomena beyond normal experience, we should not be surprised to find that much in the quantum world defies common sense. Even Einstein was troubled by what he called the “spooky” aspects of quantum theory, although he made a vital early contribution to the subject when he proposed in 1905 that light is composed of material particles we now call *photons*. The particle nature of light appeared to contradict the well-known fact that light also exhibits wave-like properties and is well described as an

electromagnetic wave. We find here the first example of the schizophrenia associated with quantum phenomena called the *wave-particle duality*.

Whether or not an object is a particle or wave seems at first glance to depend on what you decide the measure. Those eagerly looking for something else out there, something with human qualities, have seized upon wave-particle duality as implying that reality itself is a product of human consciousness. The primary theme of the quantum spirituality movement is that “we make our own reality.” This principle is the subject of many books in which the authors grandly claim a new “paradigm” in our understanding of the nature of reality, with the human mind somehow tuned into a “cosmic consciousness” that pervades the universe. Based on this notion, self-help gurus offer healing therapies alternative to those of mainstream medicine, none of which are verified by clinical studies but still rake in the dollars of people desperate for answers that conventional science cannot provide.

Quantum spirituality has been linked to Eastern mysticism, so it finds itself a welcome audience, at least in America, of Buddhists and Hindus along with the various counter-culture groups that have been predicting the dawning of a “new age.” Although at least two decades old, the new age should now be reaching fruition as with the turn of the millennium we have finally entered the astrological Age of Aquarius.

The second new imagined reality I will consider is a God who created the universe but does not act in any way that is inconsistent with the laws of nature. This God would be very difficult to detect by the means I applied in *God: The Failed Hypothesis*.

Such a god would not perform miracles, where a miracle is defined as a violation of a law of nature, so we would not expect to see any miracles. We don't. Such a God would

have left no evidence behind at the creation, so we would expect creation to appear perfectly natural to physicists and cosmologists. It does. Such a God would make sure all its designs in nature showed no signs of that design, so we would expect living organisms and their planet to appear undesigned to biologists and geologists. They do. Such a God would not answer prayers, so we would not expect to find any evidence that prayers are answered. We don't. Such a God would not reveal facts to humans that they cannot have obtained by sensory means, so we would not expect to find any evidence for such revelations. We don't.

In *God: The Failed Hypothesis* I considered the case in which God deliberately hides himself. Such a God rewards those who have faith despite the absence of evidence, while damning those who honestly wish to believe but simply cannot do so without any evidence. I asserted that this is not a moral, beneficent God. A moral God who deliberately hides himself, exacting punishment on those who do not believe for good reasons while favoring just those few who believe for no good reason is logically impossible. The very existence of nonbelievers in the world who are open to evidence for God proves that such a God does not exist.

However, we can imagine a God who deliberately hides from us but issues no punishment (or reward for that matter) if we fail to believe in him and no reward (or punishment for that matter) if we do. Such a God would not need his creations to grovel before him. Indeed, why would he if he is perfect and already enjoys infinite gratification?

Theologians have grappled for centuries with the logical inconsistency between a perfect, omniscient God who knows everything that is going to happen—indeed makes

everything happen—and one who still allows human free will. Without free will there is no sin and atonement, contradicting one of the most fundamental tenets of Judaism, Christianity, and Islam.

For a brief period encompassing the eighteenth century and not much more, a handful of thinkers in Europe and America broke openly with Christian teaching—Protestant and Catholic—and proposed the existence of a god who created the universe but left it alone thereafter. Isaac Newton had just introduced his laws of motion, which implied that the universe was a vast machine, a clockwork in which everything that happens is predetermined by what goes on before. This new theory of god was called *deism*. For the reasons given above, such a god is probably undetectable, so long as he saw that the creation itself broke no natural laws in any detectable way.

Deism made sense to these scholars who were bent on applying reason to every aspect of life. If god were perfect, why would he need to step in after he had created the universe and its laws? The primary founders of the American republic were deists and the case can be made that the republic was not founded on Christian principles, as so often asserted, but on deist principles.

However, deism barely lasted the century as a recognizable belief system while the religion of the general populace in America and Europe paid no attention to reason and focused on feelings and emotion as the means of spiritual fulfillment.

This, however, did not eliminate the theological problem of reconciling the traditional hands-on God who allows human free will with the Newtonian clockwork universe in which god's own laws already determined at the creation everything that happens including human behavior. The deist argument, though not often acknowledged

as such, may be more resilient than anyone realized because it makes so much more sense than the God the churches impose on their members. One of the big surprises of a recent survey of religious beliefs of Americans is that perhaps 40 percent of those who identify themselves as Christians do not believe in a God acts in the world or in their personal lives. That is, they may be better classified as deists rather than Christians.

Modern Christian theologians fully recognize the problem of finding a place for God to act in the world while still being consistent with science, that is, where God does not indulge in miracles that violate the laws of nature. Their problem involves not only physics but also biology and neuroscience.

The Darwin-Wallace theory of evolution is based on a combination of random mutations and natural selection. This implies that humanity is the result of countless random events from the origin of life on Earth itself over three billion years ago to the appearance of *Homo sapiens* at an estimated 200,000 years ago. If, as most religions preach, God created the universe with a special place for humanity in mind, and if theologians are to remain consistent with the overwhelming scientific consensus in favor of evolution, then they have to find a way for God to have acted during the course of evolution to guarantee humans specifically evolved, not simply some random intelligent life form.

Finding a place to act in the world of physics is a somewhat easier problem, but still not a sure thing. First, in the early twentieth century quantum mechanics indicated that physical phenomena are not fully determined by Newton's laws of motion and the physical universe is basically indeterministic at the atomic and subatomic level. Second, *chaos theory* has indicated that much (but not all) that happens on the human scale is in

practice unpredictable. We will discuss the attempts to solve the problem of God's action by the use of quantum mechanics and chaos.

We will find there is no escaping a large element of randomness in the universe over which either any existing god has no control or actually utilizes as part of its plan for the universe. It will turn out that only one possible god exists, the god that Einstein deeply opposed—the god who plays dice. We will see that modern cosmology indicates that at its earliest definable moment the universe was very possibly in a state of complete disorder and so retains no memory of anything that went before, including intentions of any creator. The universe looks just as it should look if it is composed of matter and nothing else and appeared out of nothing. It may have been created by a god who plays dice, but that god produced a universe in which he plays no role and might as well not exist.

While I will present the picture of the universe as composed of solely of matter and its origin and laws, I will not argue passionately with those who insist that it is more than simply “particles in motion.” I agree with a number of authors who have written about a concept called *emergence* in which new principles of material behavior arise as the large number of particles that make up material systems become increasingly complex. However, I do not go so far as some in claiming that some emergent principles are endowed with a property called “top-down causality,” where actions occur in the opposite direction to the “bottom-up causality that physicists use to describe the universe in terms of elementary particles. That is, systems of higher complexity are said to be able to make fundamental alterations to lower level systems.

As I will show, no convincing observations demonstrate top-down causality. I will provide examples from the first level of emergence, when thermodynamics and fluid mechanics emerges from particle physics, that indicate the whole process is still perfectly natural and material and that the only existing top-down causality is as trivial as causing the particles in a wheel to move in a circle by spinning the wheel. In short, emergence is real. But the whole is still the sum of its parts.

The chapters in this book alternate between discussions of the various claims of quantum spiritualists and quantum theologians and a survey of what twentieth century physics really said about their scientific claims. The physics chapters may be difficult going for those not familiar with modern physics, although they are written in layperson's terms without equations. I have deliberately tried not to oversimplify these discussions because much of the confusion that exists, not so much with highly trained theologians but with the less sophisticated gurus of the new spirituality, is the result of misunderstanding and, in some cases, intentional misrepresentation. I hope the reader will persevere since science and the ability to think critically, inside or outside science, can only be learned by diligent effort.

Although most of this book contains new material, I have had to repeat several arguments that were presented in some of my earlier books. I hope the reader will not consider me immodest in providing references to my own published work. However, I cannot expect most readers to go back through those references so I am forced to discuss several arguments again for the sake of completeness. Rest assured that I have not simply copied what I have previously written. I have not even gone back to read my original offerings but have started each argument over again from scratch. I expect that each time

I do this it gets clearer since I do have a good memory for the questions and comments of earlier readers and have taken these into account in the new text.

I have provided as complete a set of references as possible and attempted to quote other authors precisely and in context. I do not like it when people refer to my own work without quoting me but instead lazily put their own words in my mouth, almost always inaccurately representing what I really said. So I have taken pains not to do that with those whose ideas I am challenging here, where I either provide direct quotations or precise paraphrases that do not intrude my own interpretation of the words.

I have also provided Worldwide Web addresses where I have found some of my references. The reader is cautioned that many of these links are temporary and may no longer be active when she tries them. In that case, a simple web search will often turn up a new link for the same material, as well as other related matter.

You are welcome to e-mail your comments to me. My current address is vic.stenger@comcast.net. You may also find my extensive website helpful: <http://www.colorado.edu/philosophy/vstenger> . Again if you run into broken links, do a web search on my name.