

GOD

THE FAILED HYPOTHESIS

How Science Shows
That God
Does Not Exist

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PREFACE

The sciences do not try to explain, they hardly even try to interpret, they mainly make models. By a model is meant a mathematical construct which, with the addition of certain verbal interpretations, describes observed phenomena. The justification of such a mathematical construct is solely and precisely that it is expected to work.

—John von Neumann¹

VIEW FROM THE SIDELINES

Throughout history, arguments for and against the existence of God have been largely confined to philosophy and theology. In the meantime, science has sat on the sidelines and quietly watched this game of words march up and down the field. Despite

the fact that science has revolutionized every aspect of human life and greatly clarified our understanding of the world, somehow the notion has arisen that it has nothing to say about a supreme being that much of humanity worships as the source of all reality.

In his 1999 book, *Rocks of Ages*, famed paleontologist Stephen Jay Gould referred to science and religion as two "non-overlapping magisteria," with science concerning itself with understanding the natural world while religion deals with issues of morality.² However, as many reviewers pointed out, this amounted to a redefinition of religion as moral philosophy. In fact, most religions do more than simple moralizing but make basic pronouncements about nature, which science is free to evaluate. Furthermore, science has an obvious role in the study of physical objects, such as the Shroud of Turin, which may have religious implications. And, why can't science consider moral issues, which involve observable and sometimes even quantifiable human behavior?

In a poll taken in 1998, only 7 percent of the members of the US National Academy of Sciences, the elite of American scientists, said they believed in a personal God.³ Nevertheless, most scientists seem to prefer as a practical matter that science should stay clear of religious issues. Perhaps this is a good strategy for those who wish to avoid conflicts between science and religion, which might lead to less public acceptance of science, not to mention that most dreaded of all consequences—lower funding. However, religions make factual claims that have no special immunity from being examined under the cold light of reason and objective observation.

Besides, scientific arguments *for* the existence of God, that is, arguments based on observations rather than authority, have been made since ancient times—as early as 77 BCE by Marcus Tullius Cicero (d. 43 BCE) in his work *De Natura Deorum* (*On the Nature of the Gods*).⁴ Particularly influential was William Paley (d. 1805) with his *Natural Theology or Evidences of the Existence and Attributes of the Deity Collected from the Appearance of Nature*, first published in 1802.⁵ In more recent years, theologians and theistic scientists

have begun looking to science to provide support for their beliefs in a supreme being. Many books have been published purporting that modern theoretical and empirical science supports the proposition that God exists, and the popular media have been quick to promulgate this view.⁶ Very few books or media stories have directly challenged that assertion. But if scientific arguments for the existence of God are to be allowed into intellectual discourse, then those against his existence also have a legitimate place.

In my 2003 book, *Has Science Found God?* I critically examined the claims of scientific evidence for God and found them inadequate.⁷ In the present book, I will go much further and argue that by this moment in time science has advanced sufficiently to be able to make a definitive statement on the existence or nonexistence of a God having the attributes that are traditionally associated with the Judeo-Christian-Islamic God.

We now have considerable empirical data and highly successful scientific models that bear on the question of God's existence. The time has come to examine what those data and models tell us about the validity of the God hypothesis.

To be sure, the Judeo-Christian-Islamic God is not well defined. Not only do different views of God exist among these faiths, but also many differences can be found within each faith itself—between theologians and lay believers as well as from sect to sect. I will focus on those attributes of the God that the bulk of believers in each of these varied groups worship. Some of these attributes are also shared by the deities of religions outside the three great monotheisms.

I am well aware that sophisticated theologians have developed highly abstracted concepts of a god that they claim is consistent with the teachings of their faiths. One can always abstract any concept so it is out of the realm of scientific investigation. But these gods would not be recognized by the typical believer.

In the three monotheisms, God is viewed as a supreme, transcendent being—beyond matter, space, and time—and yet the

foundation of all that meets our senses that is described in terms of matter, space, and time. Furthermore, this God is not the god of deism, who created the world and then left it alone, or the god of pantheism, who is equated with all of existence. The Judeo-Christian-Islamic God is a nanosecond-by-nanosecond participant in each event that takes place in every cubic nanometer of the universe, from the interactions of quarks inside atomic nuclei to the evolution of stars in the most distant galaxies. What is more, God listens to every thought and participates in each action of his very special creation, a minute bit of organized matter called humanity that moves around on the surface of a tiny pebble in a vast universe.

So, when I use uppercase G, I mean the Judeo-Christian-Islamic God. Other gods will be lowercase. I will also use the traditional masculine pronouns in referring to God. This book is an investigation of the evidence for the existence of God—not all gods. It might be likened to a physicist investigating the existence of a massless charged particle, but not all particles.

SUPERNATURAL SCIENCE

No consensus exists among philosophers of science on what distinguishes science from pseudoscience or nonscience, although most scientists would say they know pseudoscience when they see it. In this book, I will take science to refer to the performing of objective observations by eye and by instrument and the building of models to describe those observations. These models are not simple snapshots of the observations, but they utilize elements and processes or mechanisms that attempt to be universal and general so that not only one set of observations is described but also all the observations that fit into as wide a class as possible. They need not always be mathematical, as asserted by John von Neumann in the epigraph to this chapter.

Perhaps the most outstanding current (mathematical) example is the *standard model of elementary particles and forces* in which all of familiar matter is composed of just three particles: the *up quark*, the *down quark*, and the electron. This model was formulated in the 1970s and to this date remains consistent with all the measured properties of matter made in our most sophisticated laboratories on Earth and observed in space with our most powerful telescopes.

Notice that the main purpose of scientific models is to *describe* rather than *explain*. That is, they are deemed successful when they agree with all observations, especially those that would have falsified the model had those observations turned out otherwise. Often this process takes the form of *hypothesis testing*, in which a model is proposed as a series of hypotheses that are then tested against carefully controlled observations. Whether the elements and processes that make up a successful model are to be taken as intrinsic parts of reality is not a question that can be simply answered since we can never know that the model might be falsified in the future. However, when a model is falsified, we can reasonably assume that those elements and processes that are unique to the model and not also part of another, successful model are likely not intrinsic parts of reality.

My analysis will be based on the contention that God should be detectable by scientific means simply by virtue of the fact that he is supposed to play such a central role in the operation of the universe and the lives of humans. Existing scientific models contain no place where God is included as an ingredient in order to describe observations. Thus, if God exists, he must appear somewhere within the gaps or errors of scientific models.

Indeed, the "God of the gaps" has long been a common argument for God. Science does not explain everything, so there is always room for other explanations and the believer is easily convinced that the explanation is God. However, the God of the gaps argument by itself fails, at least as a scientific argument, unless the

phenomenon in question is not only currently scientifically inexplicable but can be shown to forever defy natural description. God can only show up by proving to be necessary, with science equally proven to be incapable of providing a plausible account of the phenomenon based on natural or material processes alone.

This may strike the reader as an impossible requirement. How can we ever know that science will never be able to provide a "natural" account for some currently mysterious phenomenon? I claim this is within the realm of possibility, if not with 100 percent certainty, within a reasonable doubt. Using the historical association of *natural* with *material*, I will provide hypothetical examples of phenomena that, if observed, cannot be of material origin beyond a reasonable doubt. Since by all accounts God is nonmaterial, his presence would be signaled, beyond a reasonable doubt, by the empirical verification of such phenomena.

Some scientists have raised objections to the association of natural with material. They say all observable phenomena are "natural," by (their) definition. Others say any testable theory is "natural," by (their) definition. I prefer not to indulge in endless arguments over the meanings of words that never seem to converge on a consensus. I have stated how I will use the words *natural* and *supernatural*, as synonymous with *material* and *nonmaterial*. The supernatural cannot be banished from science by mere definition.

I define matter as anything that kicks back when you kick it. It is the stuff of physics. By "kick" I refer to the universal observation process in which particles, such as the photons that compose light, are bounced off objects. Measurements on the particles that bounce back into our eyes and other sensors give us properties of the observed object called mass, momentum, and energy that we identify with matter. Those measurements are described with models that contain purely material processes—the dynamical principles of physics—all subject to empirical testing and falsification.⁸

Many scientists will object that the supernatural or nonmaterial cannot be tested in any analogous manner. Indeed, in recent

political battles in the United States that have pit science against conservative religious groups who see their beliefs threatened by evolution, prominent scientists and national science organizations have made public statements and given court testimony to the effect that science can only deal with natural causes. In this they have played right into the hands of those who try to argue that science has a dogmatic commitment to materialism that prevents it from even considering any alternatives.

In this book I will show that a number of proposed supernatural or nonmaterial processes are empirically testable using standard scientific methods. Furthermore, such research is being carried out by reputable scientists associated with reputable institutions and published in reputable scientific journals. So the public statements by some scientists and their national organizations that science has nothing to do with the supernatural are belied by the facts.

True that science generally makes the assumption called *methodological naturalism*, which refers to the self-imposed convention that limits inquiry to objective observations of the world and generally (but, as we will see, not necessarily) seeks natural accounts of all phenomena. This is often confused with *metaphysical naturalism*, which assumes that reality itself is purely natural, that is, composed solely of material objects. While it cannot be denied that most physical scientists, at least, think this is the case, they cannot prove it. Furthermore, they have no need to try since ultimately it is not a scientific question amenable to empirical adjudication. If it were, it would be physics and not metaphysics.

In this book I will show that certain natural, material phenomena are implied by the God hypothesis. The observation of any of these phenomena would defy all reasonable natural, material descriptions.

Despite philosophical and historical literature in the past century that described the history of science as a series of revolutions and "paradigm shifts,"⁹ the fundamental notion of matter and material processes has not been changed since the time of

Newton—only embellished.¹⁰ Anything that can be shown to violate those principles, to have properties different from those long associated with matter, would be of such world-shaking significance that, for want of a better term, we could call them supernatural.

As far as we can tell from current scientific knowledge, the universe we observe with our senses and scientific instruments can be described in terms of matter and material processes alone. Certainly scientists will initially search for a material account of any new phenomenon since parsimony of thought requires that we seek the simplest models first, those that make the fewest new, untried hypotheses. However, should all material explanations fail, there is nothing stopping the empirical testing of hypotheses that go beyond those of conventional physical science.

GAPS FOR GOD?

Well aware that the existence of God is not proved from the incompleteness of science alone, some theologians and theistic scientists are now claiming that they have uncovered gaps in scientific theories that can only be filled by a supreme being operating outside the natural realm. They boldly assert that science cannot account for certain phenomena and, furthermore, never will. The new "proofs" are based on claims that the complexity of life cannot be reduced, and never will be reduced, to purely natural (material) processes. They also assert that the constants and laws of physics are so fine-tuned that they cannot have come about naturally, and that the origin of the physical universe and the laws it obeys cannot have "come from nothing" without supernatural intervention. Believers also cite results from purported carefully controlled experiments that they say provide empirical evidence for a world beyond matter that cannot be accounted for by material processes alone.

In order to estimate effectively the credibility of these claims,

we must be careful to properly locate the burden of proof. That burden rests on the shoulders of those who assert that science will never be able to account naturally for some phenomenon, that is, describe the phenomenon with a model containing only material elements and processes. If a plausible scientific model consistent with all existing knowledge can be found, then the claim fails. That model need not be proven to be correct, just not proven to be incorrect.

If we can find plausible ways in which all the existing gaps in scientific knowledge one day may be filled, then the scientific arguments for the existence of God fail. We could then conclude that God need not be included in the models we build to describe phenomena currently observable to humans. Of course, this leaves open the possibility that a god exists that is needed to account for phenomena outside the realm of current human observation. He might show up in some future space expedition, or in some experiment at a giant particle accelerator. However, that god would not be a god who plays an important role in human life. It is not God.

EXAMINING THE EVIDENCE AGAINST GOD

Evaluating the arguments that science has uncovered evidence for God is only part of my task, which was largely completed in *Has Science Found God?* My primary concern here will be to evaluate the less familiar arguments in which science provides evidence *against* the existence of God.

The process I will follow is the scientific method of hypothesis testing. The existence of a God will be taken as a scientific hypothesis and the consequences of that hypothesis searched for in objective observations of the world around us. Various models will be assumed in which God has specific attributes that can be tested empirically. That is, if a God with such attributes exists, cer-

tain phenomena should be observable. Any failure to pass a specific test will be regarded as a failure of that particular model. Furthermore, if the actual observations are as expected in the absence of the specified deity, then this can be taken as an additional mark against his existence.

Where a failure occurs, the argument may be made that a hidden God still may exist. While this is a logically correct statement, history and common experience provide many examples where, ultimately, absence of evidence became evidence of absence. Generally speaking, when we have no evidence or other reason for believing in some entity, then we can be pretty sure that entity does not exist.¹¹ We have no evidence for Bigfoot, the Abominable Snowman, and the Loch Ness Monster, so we do not believe they exist. If we have no evidence or other reason for believing in God, then we can be pretty sure that God does not exist.

NOTES

1. As quoted in J. Tinsley Oden, acceptance remarks, 1993 John von Neumann Award Winner, *United States Association of Computational Mechanics Bulletin* 6, no. 3 (September 1993). Online at http://www.usacm.org/Oden's_acceptance_remarks.htm (accessed February 22, 2005).
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5. William Paley, *Natural Theology or Evidences of the Existence and Attributes of the Deity Collected from the Appearance of Nature* (London: Halliwell, 1802).
6. Sharon Begley, "Science Finds God," *Newsweek*, July 20, 1998.
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8. Victor J. Stenger, *The Comprehensible Cosmos: Where Do the Laws of Physics Come From?* (Amherst, NY: Prometheus Books, 2006). Contains a complete discussion of the nature of matter and other physical entities.

9. Thomas Kuhn, *The Structure of Scientific Revolutions* (Chicago: University of Chicago Press, 1970).

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11. Keith Parsons, *God and the Burden of Proof: Platinga, Swinburne, and the Analytical Defense of Theism* (Amherst, NY: Prometheus Books, 1989).