Physics and Atheism

[This is my response of Oct. 20, 2009, to a letter
from my friend Kirby (appended below). –S.H.]

Hi Kirby and everybody,

I haven't seen this book [*The New Atheism* by Victor Stenger], but from your email I would agree that it has a number of points of interest.

However, it strongly appears to me that this book and its author are great illustrations of the claim I have been making for a long time, namely that even atheists can sometimes still be *religious* in certain basic respects. In particular, Stenger's philosophical stance is clearly of a religious nature even if he doesn't believe in any gods.

There are two basic philosophical worldviews: idealism and materialism. *Philosophical idealism* is closely associated with religion, and is in fact historically an outgrowth of religion (via Pythagoras, Plato, etc.). In its modern forms it is an attempt to intellectualize religion, or give it a form that doesn't sound so foolish and primitive (the old-man-with-a-beard-in-the-sky-tossing-lightning-bolts stuff).

The opposed basic worldview is *materialism* (often called *realism* by bourgeois writers), which also comes in various forms, some more sophisticated than others. But all forms of materialism start from the premise that there is a real world, independent of the human mind (or of any "god's mind" either!). A corollary of materialism is that there are regularities (or laws) of nature which human beings can gradually discover through their interactions with it.

If there were *no* regularities (laws) of nature, then the universe would be completely chaotic, and no such things as human beings could have come into existence (or any other form of life). For its very existence any animal must depend on huge numbers of regularities in the world (natural laws). Just to take one of countless examples, if it were not for the regularities of the inter-attractiveness of matter (which we sum up as the *law* of gravity), there could be no human beings, no life, and not even any earth. The law of gravity is *NOT* an arbitrary invention of human beings, but rather one of many natural laws that must exist before human beings could have even come to exist.

One of the reviews below quotes Stenger as saying:

"I have argued that the laws of physics are not rules handed down by God or built into the structure of the universe. They are human inventions. They are not restrictions on the behavior of matter."

This is complete idealist bullshit! There are in fact laws of nature which are characteristics of the

universe. Many of these laws still seem mysterious to us, while others have come to seem obvious and necessary in light of more basic laws. It is true that the laws of physics are not "handed down by God", but it is not true that there are no actual laws of nature. To claim otherwise is to disown materialism.

[By the way, this gets into the question that Einstein raised, unfortunately in religious terminology: (Quoting from memory:) "What I want to know is whether or not God had any *choice* in his specifications of the laws of nature..." The idea here is that the laws of nature may be so interrelated and interconnected that there is no way they could be different at the most basic levels. (That is an idea with a lot of plausibility, as far as I am concerned!) If this is in fact the case, then there would not even be any *possible* role for any imagined "designer" of the universe.]

In an earlier book Stenger also claimed that modern physics (properly understood) disproves the existence of God. This is just not possible except from a materialist perspective (which is more a matter of cognitive psychology than physics).

As you'll recall, Richard Dawkins thinks that the existence of God can be "more or less" disproved via biology. It is true that evolutionary science has destroyed one of the most central reasons for believing that there must be a God, by giving an alternative, materialist, explanation for how human beings arose. But it is still possible for the more sophisticated religious people to simply say that God created human beings *through the medium of evolution*.

In the same way, *nothing* that can be said about physics is really going to prove that no God can exist. The religious can still always claim that God himself created the laws of physics. Perhaps Stenger realizes that on some level, which is why he tries to push the absurd idea that the laws of nature are simply human inventions. But even if that could somehow possibly be the case, it wouldn't serve to *disprove* the existence of God. (It could be argued, for example, that God left it to human beings to "construct their own world" in accordance with the laws of nature they invented!)

The only thing that can truly disprove the existence of God, from a scientific point of view, is a scientific explanation for what *minds* and *mental phenomena* are in the first place, a theory that explains just how minds can arise from the complex organization of matter and why minds can *only* arise in that way. This is the realm of cognitive psychology, and not of physics and basic biology.

Yes, Stenger is right to try to debunk idealist theories of physics and cosmology, theories that give rise to the *claims* by religious people that physics itself proves the existence of God. But Stenger seems to do a piss-poor job of it. Since he apparently agrees that the universe somehow "came into existence" *ex nihilo* (out of nothing) with the Big Bang, he actually plays into the hands of religious cosmologists.

And perhaps even worse, he puts forward additional idealist notions such as the laws of physics are mere human inventions or conventions. This is an attack on materialism, and that serves to undermine the real scientific reasons which show that no gods or devils can exist. In other words,

it seems to me that he is actually doing more to *support* religion than to *undermine* it.

Scott

P.S. Kirby, I know that you were most concerned to applaud Stenger's theory of what *time* is, but for me that is a very secondary issue here. We can get into that later, if you want.

----- Original Message -----
From: Kirby …
To: Scott
Sent: Monday, October 19, 2009
Subject: physics and atheism

I'm currently reading "The New Atheism" by Victor Stenger. "New Atheism" is the label given to folks like Dawkins, Dennett, Hitchens and Harris who are not quiet, stay in the closet atheists, but in your face atheists. Stenger is also one of the New Atheists and this is his third (I think) book that functions as an atheist apologetic. It's very good, but that's not what this email is about.

Stenger is also a physicist....I believe currently a professor at University of Hawaii. In this book he uses a lot of physics...basically showing how several of the current arguments FOR God (Big Bang is supportive of Creation as per Genesis, the universe is "fine tuned" for human life, etc.) derive from misunderstandings or willful misinterpretations of physics and cosmology.

That's STILL not what this email is about. Here's what it's about:

From the book I've gotten some better understandings of physics than I have from many of the physics books we've read. He is writing a book about atheism after all, and his physics is simplified for the reader (he doesn't contradict anything we've read...just stated it a little more clearly). He's also written some physics books, among them "Comprehensible Cosmos". I put in boldface the sentences I wanted to comment on:

Here is a review of the book:

Review of Victor Stenger's Comprehensible Cosmos

January 24, 2007

Where do the laws of physics come from? The Power of P.O.V.I.

In this admirable new book, physics professor Victor Stenger once again exhibits his notable ability to convey complex ideas of physics with simplicity and elegance, while not sacrificing mathematical rigor and detail. Moreover, the book offers a "big-picture" perspective that will appeal to both physicists and non-physicists. However, although not required, a basic familiarity with physics and a mathematical background will greatly enhance readers' appreciation and comprehension of the book, particularly concerning the helpful

mathematical supplements provided at the end.

Here Stenger takes on "ultimate" questions, such as, Where do the laws of physics come from? and Why is there something rather than nothing?- answers to which are commonly believed to be found exclusively within the province of theological and philosophical discourse and to be inherently beyond the reach of empirical and theoretical science. Stenger argues that the extraordinary empirical success of our current models of physics, though still incomplete and provisional, gives us good grounds to assume that they are on the right track: the cosmos is indeed comprehensible, and our current physical models provide a description of nature that is likely to faithfully reflect aspects of a reality that exists independently of our thoughts and particular physical models.

Stenger argues that, contrary to some popular views, the so-called "laws of physics", such as the great conservation laws, are not restrictions on the behavior of matter imposed by an external agent or by a world of abstract Platonic mathematical forms. Rather they arise from the self-imposed requirement that physicists' descriptions of nature be independent of the particular point-of-view of observers- that they be point-of-view invariant. In order to ensure universal applicability and to describe reality as objectively as possible, physicists aim to construct mathematical models that describe nature in such a way that these descriptions do not depend on the particular point of view or reference frame of observers. For instance, the law of conservation of energy is a manifestation of time-translation invariance. A description of nature that does not depend upon the absolute time at which observations are made will automatically entail the conservation of a quantity called `energy'. Similarly, the law of conservation of momentum naturally arises from the requirement that physicists' descriptions of nature are space-translation invariant- that they do not depend upon any particular point in space.

Stenger's account builds upon the work of mathematician Emmy Noether, who proved that certain mathematical quantities called the generators of continuous space-time transformations are conserved when those transformations leave the system unchanged. Hence, the great conservation laws are consequences of point-of-view invariance and thus are reflections of the symmetries of space and time. As Stenger puts it: "If you wish to build a model using space and time as a framework, and you formulate that model so as to be space-time symmetric, then that model will automatically contain what are usually regarded as the three most important "laws" of physics, the three conservation principles". Stenger further demonstrates how Newtonian mechanics, quantum mechanics, and special and general relativity also arise naturally from the point-of-view invariance and symmetries of our physical models.

In addition to showing the intimate connection between the laws of physics and the symmetries of space and time, Stenger argues that features of our complex lower energy universe may be accounted for by the spontaneous breaking of symmetries that were present during the higher energy state of the big bang. Our universe is akin to a less symmetric snowflake that froze out of a more symmetric sphere of water vapor. Stenger discusses the possibility that our universe arose via a well-understood process of quantum tunneling from a highly symmetric void, empty of energy, particles, space, and time- a featureless state essentially equivalent to `nothing' . Since the void also exhibits space-time symmetries, the laws of physics are ultimately derived from the symmetries of the void. Indeed, Stenger argues that the laws of physics are not really laws at all, in the usual sense of the term. On the contrary, they are reflections of the absence of laws- they are what Stenger refers to as "lawless laws". Other aspects of nature, such as the apparent indeterminism of quantum mechanics can be accounted for by an element of randomness in

the universe (which, Stenger notes, is itself a manifestation of invariance). Ultimately then, symmetry and randomness lie at the bedrock of reality. Hence, the universe is not only comprehensible, but may have arisen in the simplest way possible: randomly and spontaneously from a highly symmetric void, that is, from a state essentially indistinguishable from `nothing'. But then why is there something rather than nothing? Indeed, if the universe came from a void, then why did it not remain as a void? The answer Stenger offers, and which gains support from the work of other physicists, is that a symmetric void is unstable- hence there had to be something. Our universe is simply a different phase of `nothing', just as ice and steam are different phases of water.

There are plenty more topics discussed in this original and insightful book, including particle physics, cosmology, and thermodynamics, which are beyond the scope of this review. Perhaps some readers might complain that Stenger is too cautious in his lack of commitment to particular physical models of reality. At times he suggests that "scientific criteria cannot distinguish between viable metaphysical schemes" and that space and time are useful inventions that cannot be proven to exist. While this may be the case, this suggestion may be seen to weaken his thesis that the cosmos is comprehensible and that physics is not just another cultural narrative. On the other hand, Stenger emphasizes throughout that our physical models ultimately must be constrained by and consistent with empirical observations. Indeed, the relentless testing of the observational consequences of our physical models is what distinguishes physics from fiction. Thus, our physical models, while human inventions, are not just arbitrary cultural constructs. To the extent that they succeed in describing nature and surviving risky empirical tests, they likely represent aspects of an underlying reality independent of our specific models. Moreover, Stenger comments on how a particulate model of reality characterized by "atoms and void", which he explicitly favors, displays some virtues over a model characterized by waves, fields, and other "Platonic" mathematical constructs. If indeed physics does have implications for metaphysics, then physics might someday provide compelling empirical or theoretical reasons to prefer one hitherto observationally equivalent metaphysical model over another. In any case, readers will appreciate the elegance and simplicity of Stenger's expository style, which are paralleled by the elegant simplicity of the scenario he has described for the origin of the universe and of the laws of physics.

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I'm not suggesting we read the book....for one thing this next review turned me off right away. Again I put a sentence or two in boldface:

From Publishers Weekly

Stenger (*Has Science Found God?*), emeritus professor of physics at the University of Hawaii, goes to great lengths to explain that, although he is not completely convinced that the laws of physics as we know them have objective reality, he doesn't subscribe to the postmodernist notion that there is no such thing as objective reality. Stenger explains that the power of currently accepted models of physics arises from what he calls "point-of-view invariance," i.e., they have the ability to make the same predictions regardless of where or when an observer is taking measurements. While this point is well made and important, **Stenger's descriptions of the models of physics and his discussion of cosmology will be largely incomprehensible to the average reader. A third of the book consists of eight mathematical supplements designed for "anyone who has taken**

the major courses in a four-year curriculum of undergraduate physics, chemistry, engineering, or mathematics." B&w illus. *(July)*

On the OTHER hand:

Epitome of physics, December 11, 2006

By **Keith Douglas** (Ottawa, Canada) - See all my reviews

This small (320 pages of text) is, in essence, an epitome of the basic physics of our day. It covers space and time, classical and quantum mechanics in their fundamental form, relativity, thermodynamics, cosmology, particle physics and their interactions. Each topic is treated in rough terms in a main chapter and with precision in a mathematical appendix. What makes this work unique (and not just another textbook of physics) is an attempt to systematize the material under a few very basic principles. Most important of these is the generalized form of invariance called "point of view invariance" by the author, though other postulates are introduced as necessary. My only quibbles are: (a) these principles could be summarized somewhere, (b) the debates discussed in the book over instrumentalism, realism, etc. are too perfunctorally discussed. However as this is not a philosophy of science book on those topics, the oversights can be forgiven. Finally, (c) as a non physicist, I do find myself wondering which approximations are good ones and which not. Sometimes, to achieve equality of two terms, etc. Stenger makes mathematical approximations. This is indispensible; instead what could have been useful is some discussion of where the assumptions so made break down. This is done in some places (e.g. in the discussion of the connection between Newtonian and Einsteinian understandings of motion) but not others, so the flaw, such as it is, is not ubquitous.

Other merits of the book include a clear writing style, bibliographic suggestions for further reading, helpful diagrams and some historical perspective by including years of death for various key physicists.

If you are still reading...wow! Even I wouldn't have read this far if someone sent this to me....the reason I'm writing this incredibly long email is because of something Stenger says in "The New Atheism":

"I have argued that the laws of physics are not rules handed down by God or built into the structure of the universe. They are human inventions. They are not restrictions on the behavior of matter. They are restrictions on what physicists may do when they formulate mathematical models to describe their observations of matter……..In 1918 a German mathematician…..proved that the laws...." (of physics) "…must be part of any mathematical theory that does not single out any particular position in space, direction in space, or moment in time….In fact, space and time are…..just human inventions. **Time is defined by what is measured on a clock**. The distance between two points in space is defined by how long it takes, measured on a clock, for light in a vacuum to travel between the two points."

Exactly! Thank you, Victor Stenger. He sums up in a few words what I've been trying to give voice to for years. Time (as most people think they understand it) is really just a human invention. Yes, things "happen" independently of whether we exist or not. For our convenience we talk of them as happening in "time" - past, present, future and of occuring over time - a nanosecond, a year, a million years....but all this really means is that things have CHANGED...particles moved from here to there or winked into or out of existence...and it is convenient to assign a "time frame" to them (or as he refers to it, build a mathematical model). But time is not a dimension or a real thing, it is a convenient human invention (model).

I'd never thought of space or direction in the same way, but I sort of have an intuitive feel for what he means. I'll probably buy the book and skip the math part.

"*What if all the gods we know are fiction but the one real god has no believers?!*" - Guy Harrison