Playing Fast and Loose with Complexity:
A Critique of Dawkins' Atheistic Argument from Improbability

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Abstract

This paper is a critique of Richard Dawkins' "argument from improbability" against the existence of God. This argument, which forms the core of Dawkins' book *The God Delusion*, provides an interesting example of the use of scientific ideas in arguments about religion. Here I raise three objections: (1) The argument is inapplicable to philosophical conceptions of God that reduce most of God's complexity to that of the physical universe. (2) The argument depends on a way of estimating probabilities that fails for the probability of an entity that creates natural laws. (3) The argument supposes that complexity arises from past physical causes; however, some forms of complexity known to mathematics and logic do not arise in this way. After stating these three criticisms, I show that some of these same considerations undermine Dawkins' critique of agnosticism. I close the paper with some remarks on Dawkins' conception of God.

Introduction

Richard Dawkins' book *The God Delusion* is one of the major texts of the so-called New Atheism. In this paper I will focus on one crucial aspect of the book: what Dawkins calls the "argument from improbability" against the existence of God (pp. 109, 113-114).[*] Dawkins calls this argument, together with some associated ideas about complexity in nature, "the central argument of my book" (p. 157). The argument from improbability is of interest for several reasons, including the way it deploys scientific ideas to make points about religion. Here I will point out three serious flaws in this argument.

First I will fill in some background about the argument. The "argument from improbability" is an argument that focuses on the complexity of God. Dawkins defines "God" to mean a supernatural creator of a certain sort (p. 31; see also pp. 11-15). The argument begins with the seemingly reasonable point that an intelligent being capable of creating the universe would have to be very complex (ch. 4, especially pp. 113-114, 157-159). (To get the point, think of the human brain, a known creative system. It could not do what it does without the complex interaction of billions of its parts. This brain analogy is implicit in the argument; Dawkins makes it more explicit on p. 54.) Theistic religions also traditionally teach that God knows our thoughts, answers our prayers, and sends us messages. Dawkins claims that activities like these would require God to be extremely complex. "Such bandwidth!", he says in one emotionally heated passage on alleged divine communications (p. 154).

From the assumption that God would have to be very complex, Dawkins argues that God is very unlikely (ch. 4). He points out that in nature, highly complex systems are highly improbable. In his main example (inspired by an analogy attributed to Fred Hoyle), he

[*] Page numbers for *The God Delusion* refer to the edition listed in the "Works Cited" section of this paper.

points out that chance interactions of matter will not, in practice, produce an airliner. The probability that such a machine would arise from machine parts through pure chance is so small as to be essentially zero (pp. 113-114). In Dawkins' view, to believe in a highly complex God is to assume that there is a highly improbable being. Dawkins argues that if we assume God to be the source of nature's complexity, we are merely adding to the mystery we are trying to explain (pp. 109, 158, and elsewhere). Dawkins points out correctly that evolutionary theory explains the complex diversity of life on Earth. He argues that other kinds of complexity, in cosmology and elsewhere, might well be explainable through other scientific concepts such as the anthropic principle (pp. 134-151). However, explaining the complexity of nature by assuming the additional complexity of God is (according to Dawkins) merely a way of compounding the problem.

There are at least three things wrong with the argument from improbability. The first of these three faults seriously weakens the argument; the last two fatally undermine it. I will discuss the three problems in turn.

Objection 1. An Overly Narrow Definition of God

The first problem is that the argument works only for some conceptions of God. As I will point out in the Appendix, there are philosophical conceptions of God, as supreme being or supreme reality, that do not portray God as a creator external to nature. According to some of these conceptions, the complexity of God is not something added to nature, but simply *is* the complexity of nature. This is true of pantheistic ideas of God, which equate God to the universe as a whole or to its underlying reality. (Not all forms of pantheism are the "sexed-up atheism" that Dawkins calls pantheism (p. 18). Some pantheisms postulate a God who really is a God. See the Appendix for details.) The same statement about complexity may hold true of pan*en*theistic conceptions of God (note the "en"). According to panentheism, God includes, but is more than, the physical universe. If this

is the case, then the complexity of God might be mostly or entirely that of the physical universe. Other conceptions of God also could reduce God's complexity to that of the physical universe. This potentially could be true of any idea of God that portrays God as intimately intertwined with nature in some way (see, for example, [1]).

Dawkins' argument from improbability does not hit any idea of God that equates the complexity of God to that of nature, or that is compatible with the view that God's complexity is reducible to that of nature. Therefore, many possible ideas of God are invulnerable to Dawkins' argument. The underlying reason for this failure of the argument is the narrowness of Dawkins' definition of God. That definition captures many traditional religious ideas of God, but leaves out many other, more philosophical concepts of God. (Again, see the Appendix for details.)

Objection 2. Probability Estimates Depend on Natural Laws

The second flaw does not depend on alternative ideas of God, but destroys Dawkins' argument if *his* definition of God is correct. If God is a supernatural creator of the universe, then Dawkins' argument fails because it ignores a crucial fact: a supernatural creator might well not be bound by natural laws. If we take God to be the supernatural creator of the universe, then presumably God also is the creator of the laws of nature, and might be able to violate those laws. (Most theistic religions hold this belief; they teach that God made the laws of nature and can break them.) However, the judgment that an object is probable or improbable depends crucially on the details of the laws of nature. If an object is not subject to any known natural laws, we cannot very well decide whether that object is probable or improbable. [2]

To understand this problem with the argument, we should look at some examples of how natural laws affect the probabilities of the existence of natural objects.

First, a simple example from physics. Imagine a universe in which a law of universal gravitation holds, with no other long-range forces to counteract the gravitation. Such a universe is relatively likely to contain clumps of matter, because particles of matter will tend to move toward each other and clump up. In this way, diffuse matter can change into things like stars and planets. Clumps of matter are highly probable in such a universe. If, on the other hand, there were a universal law of *anti*gravity instead of gravity, then particles of matter would tend to move apart, and a diffuse gas of material particles would be more probable than clumps. In that case, clumps such as planets and stars would be strikingly *im*probable.

Here is another example. According to the laws of classical mechanics, if a particle with no applied forces is spinning in a random direction, and someone measures the particle's angular momentum component along a given axis, the result can be any real number between a minimum and a maximum value. Any direction for the angular momentum vector will be equally probable; hence any finite interval of values within the allowed range of the component will have a nonzero probability. However, if the laws of quantum mechanics hold instead of the laws of classical mechanics, then the measured value of the angular momentum component will lie in a discrete set of possible values. The probability of any range of values outside these discrete values will be zero—not just small, but *zero*. The component simply cannot have any value outside of the finite set. (This is just an example of the familiar quantization of angular momentum in quantum mechanics.)

Here is yet another example. In a universe full of electrons and nuclei obeying quantum mechanics, stable atoms can form as the nuclei capture the electrons. However, if the universe full of electrons and nuclei obeys *classical* physics, there will be no stable atoms. Because of a well-known radiation phenomenon, any atomlike systems that form in the classical universe will collapse almost immediately. (Indeed, this is one of the

standard classroom reasons why quantum physics superseded classical physics: only quantum physics allows stable atoms.) The choice of laws of nature (classical vs. quantum) determines whether stable atoms can exist at all. In this example, the universe obeying quantum mechanics will contain matter of a much more complex kind than will the universe obeying classical mechanics. After all, atoms are more complex than loose electrons and nuclei—and the things that atoms can combine into can be incredibly complex. The probability of stable atoms is high in one possible universe and zero in the other, because of a difference in the natural laws governing the two possible universes.

The lesson from these examples is simple: the probabilities for the existence of objects are sensitive to the details of the laws of nature. Those probabilities are not just abstract consequences of mathematical probability theory. Instead, they can depend crucially on which natural laws are applicable to the object. There is no general way to estimate these probabilities sensibly without knowing the laws of nature.

According to Dawkins' definition of God, God created the universe. Presumably this includes the creation of natural laws; at least the definition leaves open this possibility. Traditional theistic belief definitely takes God to be the author of natural laws. Now let's ask Dawkins: How are we supposed to make a realistic estimate of the probability of the existence of God, when God (for all we know) is not even bound by *any* natural laws?

The only rational answer is: Not very well. Unless we know something about the laws that God follows, we can't really begin to estimate the probability that there is a God. In the absence of unbreakable natural laws, how do we know that a complex structure like God can't just appear (poof!) out of nowhere? Remember how a change in natural laws affected the probabilities of physical systems in our examples. Might the complete absence of natural law, or a freely changeable set of laws, allow a wide spectrum of different random machines to come into being—perhaps including one with superhuman intelligence? Without a set of natural laws to go by, we can't really get a mental grip on

this question. We don't know how to assign probabilities to things—even in a vague, qualitative way—without some idea about which natural laws apply.

Objection 3. Deductive Cranes

Even without these first two objections, Dawkins' argument from improbability would fail for another reason: *not all complexity is a product of past causes*. Some complexity is just part of the logical structure of the world—and complexity of this sort is not improbable at all. This statement may seem mysterious, but it is not. I'll give some examples to point out what it means.

Consider fractals—those wonderful mathematical object that have attracted so much artistic attention. It isn't hard to find pictures of these on the web. A fractal can have an incredibly complex structure, containing all sorts of intricate patterns, forms, and variations. Yet fractals are amazing, not only because of their complexity, but because of their *underlying simplicity*. Typically, a fractal is generated by the repeated application of a simple mathematical procedure. Fractals typically are self-similar, which means (more or less) that similar patterns are repeated over and over again at larger and smaller scales. The immense complexity of a fractal is built up from an original simplicity that is not visible to the unaided eye. This does *not* mean that the complexity isn't real, or that fractals actually are only simple and not complex. (I'll have more to say about this topic later.) It just means that the complexity is a logical consequence of a few much simpler facts. Once we assume that there exist sets of points obeying certain simple rules, we are forced by sheer logic to admit the existence of the whole structure of the fractal, with all its exquisite patterns, stunning intricacy, and built-in quantities of information at every scale.

Fractals are not unique in this respect. The same theme recurs again and again throughout

mathematics and logic. One need only look at the subject of set theory to realize how much complexity can arise from a few simple rules. Beginning with a handful of axioms that seem self-evident, set theorists derive the existence of *infinitely* many sets that have *infinitely* complex structures. Even the old geometry of Euclid exhibits this feature. From a small set of axioms and postulates, one can derive a multitude of theorems and deduce the existence of an endless diversity of forms. All major mathematical theories are like this. Once you assume a few basic rules, you can deduce a huge number of new facts and prove the existence of a huge number of new structures—perhaps including things you hadn't dreamed of in advance.

The lesson from mathematics is clear: *The simple can logically entail the complex.* Not all complex structures are produced by the interaction of simple parts as in biological evolution. Instead, their existence is a logical consequence of simple premises. These structures are not "caused," but instead are logically implied or entailed by something simpler. The road from the simple mathematical rule to the fractal does not depend on evolution, design, or accident. Given the truth of the starting facts, the entire complex structure just has to be there. It's just a matter of logic.

Someone might try to argue that these forms of complexity are not really complexity at all, since the mathematical structures are generated by only small amounts of information. If the amount of information in a system is an indicator of the system's complexity, then isn't a fractal really an example of simplicity instead of complexity? The answer is no, if we have in mind any reasonable notion of complexity that matches our informal idea fairly well [3]. Suppose that I draw a picture of a plant. That picture contains a certain amount of information. Now suppose that later, I magnify a tiny piece of a plot of a fractal, and discover a shape exactly the same as that of the plant that I drew. (Plantlike shapes seem fairly common in the fractals I have seen.) Does that mean that the information in the original plant drawing was not really there, and that only the information in the rule for creating the fractal is real? Obviously not. It only means that

the information in the plant drawing can be *generated* by application of the rule for the fractal. The same argument works for weightier pieces of information found in mathematical structures. Take set theory as an example. Given any finite pattern, the standard version of set theory (ZF) provides a set that represents that pattern. [4] Thus, the pattern of connections among the neurons in your brain is represented by some set. Does that mean that the complexity of the neuronal network of your brain isn't real, and that your brain is as simple as the handful of simple rules that govern the set theory? Of course not. It would be silly to conclude that the neuronal network of the human brain isn't complex after all. Instead, we should say that the complexity of the brain is real complexity, which can be *generated* from the rules of set theory. Here "generated" does not mean "caused to exist"; instead, it means "found through mathematical deduction." (This kind of "generating" is not a process in time, but is a logical relationship between the underlying rules and the resulting structure.)

One might wonder whether this kind of complexity-from-simplicity is relevant to the physical world, or whether it exists only as a mathematical abstraction. Can we find this kind of complexity in the physical world around us? The answer is yes. Implied complexity of this sort also occurs in physical systems. To see this, we must notice a fact that often goes unnoticed: all physical objects have lots of mathematical properties. Even a simple physical system, like a triangular arrangement of three rocks, has a large set of geometric, arithmetical, and logical properties.

Let's look at some of these properties for the system of three rocks. To begin with, there is a multitude of *relationships* among the rocks. For example, the following relationships might hold: rock 2 is located in space between rock 1 and rock 3; rock 1 is heavier than rock 2; rock 3 is lighter than rock 2; rock 3 is lighter than rock 1 (this follows from the last two relationships, but is a relationship also); rock 3 is smaller in volume than rock 2; rock 1 contains more carbon than rock 2; rock 2 contains less silicon than rock 3;…. To a logician, all of these relationships are legitimate items for study. There are lots of these

relationships.

Besides their relationships, the rocks form the foundation of a multitude of *sets*. Rock 1 and rock 2 form a set; rock 2 and rock 3 form a set; rock 1 alone forms a set (known as a "singleton set" to mathematicians); and so forth. The fact that these rocks form sets is a legitimate mathematical fact. What is more, the sets of rocks form still other sets. These are sets of sets—a common type of mathematical object. (Sets of sets may seem exotic, but they are not. We use such sets of sets in our everyday reasoning; think of an *alliance* of *nations* of people. Scientists also use sets of sets without realizing it; think of a *genus* containing *species* of organisms.) From the sets of sets, we can form sets of sets of sets, and so forth. For each of these many sets, there is a legitimate mathematical fact that one can form that set by starting with the three rocks. All this talk will sound boringly familiar to set theorists; it is a very simple application of what is called "the iterative conception of set." Even for a small assemblage of physical parts, there are lots of relationships among the parts, lots of sets containing the parts, and lots of facts true of the system and its parts. (If you are a philosopher worried about the reality of mathematical objects, there are at least lots of *facts* true of the system and and its parts. This much seems indisputable.)

We now see that the logical complexity of even a "simple" physical system is very high if we look at the full inventory of properties and relationships of the system and its parts. Even if physical objects are not astonishing structures like fractals (and until we have a "final theory" we don't know that they aren't), we still can find huge amounts of logical complexity among the ordinary properties and relationships of physical objects.

In the physical world as in the mathematical realm, we can find complexity whose existence follows logically from very simple sets of underlying facts. There is nothing magic about this complexity. It is just a matter of logic, with no miracles or sleight of hand involved.

Now back to the topic of God. Without arguing for or against a supernatural creator, I would like to pose the following question: *What if there were a supernatural creator, and that creator was very complex—but its complexity was a logical consequence of a very simple set of facts?*

To speculate on this question, we do not have to believe in a supernatural creator. We can merely consider the possibilities, and show how they affect Dawkins' argument from improbability.

What if there were a complex supernatural creator, but that creator was complex only by virtue of a simple set of facts that logically entailed the existence of a lot of complexity?

Now I am going to propose three thought experiments that offer hints as to how this might happen. Two of these are science fiction scenarios involving a superhuman intelligence reminiscent of Dawkins' God. The third scenario does not involve a godlike being, but shows how a lot of complexity could appear in the real world without previous physical causes. You don't have to believe any of these scenarios to follow my argument. They're just thought experiments, meant to demonstrate how something in the universe (or outside of it) could have tremendous complexity attributable to logical factors alone.

Thought Experiment 1.

Suppose that outside the known physical universe there was another object—an object describable as a mathematical space. (This suggestion isn't much different from some of the many-universes speculations in present-day theoretical physics. I'm thinking especially of the "branes" on which string theorists speculate—though what I'm imagining here might not be much like those "branes.") Suppose that the existence of this object is the result of processes governed by certain natural laws. What is special

about this object is that it has a geometric structure fixed by *a few simple mathematical rules*. These rules resemble the rules governing a fractal or set theory in at least one respect: a structure that follows these rules will contain a multitude of patterns, combinations, and substructures of breathtaking intricacy. (As I said before, such sets of rules are common in mathematics.)

Now suppose that these rules imply the existence of many different patterns—so many that any pattern we can think of, or at least any pattern within certain broad limits, is very likely to appear among the patterns within the space. This possibility is not mathematically outlandish. Something even worse happens in set theory, where a small set of rules implies the existence of infinitely many infinitely complex patterns.

In this special space, one of the countless patterns happens to duplicate the structure of a human brain down to the subatomic level. (The structure of a human brain is, after all, just one pattern among many, even though it's a shockingly rich and complex pattern. A space with a rich enough selection of patterns will contain such a pattern somewhere.) This pattern isn't exactly like a human brain—for one thing, it's much "bigger," in the sense that it's even more complex than our brains. However, it is like a brain in key respects, and has the structural features that we usually associate with an intelligent system. This pattern changes through time, allowing it to do information processing. (I'm assuming, as part of the thought experiment, that the other space has a dimension that serves as time, just as our universe does.) This brainlike pattern is an *intelligent pattern*.

Our own brains are systems of physical parts storing patterns of information. Our brains manage to be intelligent. Thus, there does not seem to be anything logically impossible about the superintelligent "brain" that I just described. The "universe" that I just described also seems to be logically possible—although I know of no reason to think that such a "universe" actually exists. (Remember, this is only a thought experiment!)

Most of the ideas used in this thought experiment are not new. Ideas about other universes have long been subjects of scientific and philosophical speculation. Ideas about alternative kinds of brains are well-known too—especially in the artificial intelligence field. What is different in this example is the way the brain came to be. In our experiment, a superior intelligence outside our universe exists—but not because of evolution *or* deliberate creation, and not because of a fantastic bit of chance like the self-assembly of an airliner. This intelligence simply *exists because it has to exist.* In philosophical terms, its existence is *logically entailed* by the properties of the universe in which it exists. Given the rules of the universe it exists in, this intelligence might be said to exist by virtue of logic alone.

Thought Experiment 2.

Now take Thought Experiment 1 and modify it a little bit. Assume that, because of some natural laws not yet known to us, the other universe in Thought Experiment 1 also inevitably had to exist.

The idea that certain items in nature have to exist, because their existence is a logical consequence of natural laws, is not new. In quantum field theories, the existence of fields in the physical vacuum is a consequence of physical laws. Once one grants the laws, one cannot escape the logical consequence that these fields exist. There is nothing incredible about this kind of "forced" existence. Our scenario involves something analogous to this. A universe of a particular sort exists because it has to.

From the inevitability of the universe just described, and the inevitability of the "brain" given the existence of that universe, it follows that the "brain" in our imagined universe has to exist. There is no escaping this consequence once we grant the premises of the thought experiment. Given the laws of nature, there has to be an extremely complex

intelligence outside our universe.

Once again, we get great complexity without evolution, design, or accident. The complexity is there simply because it has to be there.

Thought Experiment 3.

Now let's imagine a slightly different thought experiment. Let's set aside these science fiction scenarios about other universes, and just look at some known mathematics and philosophy.

Let's suppose, for the sake of argument, that mathematical objects are real. Philosophers have held various opinions about the reality of mathematical objects. Some have held that mathematical objects are only ideas in the human mind (conceptualism) or that their existence is only a figure of speech (nominalism). Others, the mathematical realists, have held that mathematical objects are fully real, perhaps with a kind of existence different from that of physical objects. (Elsewhere [5] I have argued for this last view: abstract objects, of which mathematical objects form a subtype, are features of reality but don't exist in the same way that physical things exist. It seems wrong to say that mathematical objects aren't features of reality at all, when physical objects *really do* have certain shapes and occur in certain numbers.) For this scenario, let's assume that mathematical objects, including fractals and other sets, are real in some manner—at least they can be thought of as real features of the real world.

Mathematics allows for patterns with unlimited complexity. (Think of fractals or of Euclidean geometry—then think of set theory, with its infinite number of infinite sets and patterns.) Somewhere among all these patterns is a pattern just like the structure of a human brain persisting through time—duplicating that structure right down to the subatomic level. Elsewhere among these patterns are brainlike patterns resembling brains

much smarter than human brains.

Would these brainlike patterns really be intelligent? Perhaps not, but that doesn't matter for our purposes. The important point is that the world in our scenario contains a mind-boggling amount of complexity—and that complexity is not the result of chance or of evolution. Instead, it is the result of the fact that some mathematical structures follow some simple rules.

In this scenario, the world contains a stunning amount of complexity that *could not have failed to exist*. Nothing had to happen to make this complexity exist. It exists as a logical consequence of a very simple set of facts. However, despite its simple roots, this complexity is *real* complexity—unless you want to say (absurdly) that complexity equal to that of a human brain is not real complexity! Most importantly, there is absolutely nothing supernatural about all of this—unless we want to get really silly and call mathematics "supernatural."

The above three thought experiments are not all equally plausible. Certainly there is no reason to believe that the first two are true, though both are logically possible. The third scenario is not science fiction, but mathematics plus a bit of philosophy; it might well be true. However, the actuality of these particular scenarios is not the issue here. All three experiments are meant to make the following point: *Complexity does not have to be a product of physical processes of evolution, design, or accident. The emergence of complexity seemingly out of nowhere, with no physical process gradually building it up, does not have to be a miracle or a fantastically improbable coincidence. Sometimes it might be an inevitable physical or logical necessity.*

This fact completely undermines Dawkins' argument from complexity. Once we admit the possibility (even remote) that some complexity is logically inevitable, then we can no longer carelessly jump from the premise that God is complex to the conclusion that God

is improbable. Instead, we must admit the possibility that God is complex but not improbable—because God's complexity might be of the logically inevitable sort.

Note that this finding does *not* carry over to the airliner or other ordinary physical objects. For the airliner, the corresponding inference is well-justified: because the airliner is complex, it is improbable. We can make this inference with confidence, because the complexity in an airliner is *not* logically inevitable. Any airliner that exists might well not have existed, had things gone differently in the past. Hence the complexity of an airliner obviously cannot be an inevitable feature of the world. The same goes for any familiar physical object. However, we cannot generalize this conclusion to God, because we don't know whether God's complexity is inevitable or not. Since God is supposed to be the creator of the whole universe, it doesn't seem too strange to ask whether God's complexity might be a basic feature of the universe—more like the complexity of a fractal than like the complexity of an airliner.

Now we can see why a complex God might be more than just a useless addition to nature's complexity. Instead, the complexity of God might be an unavoidable feature of the real world—something that would exist regardless of the details of natural events. If such unavoidable complexity exists, we cannot handwave it away for the sake of a simpler worldview.

Dawkins argues (pp. 73, 157-159) that the correct explanation for any instance of complexity in nature must be a "crane" (a gradual, incremental process) and not a "skyhook" (an assumed source of unexplained complexity). (He attributes the crane and skyhook terminology to Dennett (p. 73).) Now we have an alternative that Dawkins did not foresee: complexity that arises naturally from the logical structure of things, instead of from past physical causes like evolution, design, or accident. This extra option clearly is a "crane" and not a "skyhook." The complexity is a consequence of small, understandable logical steps, so the origin of the complexity has the incremental and non-

mysterious character of a crane. Most importantly, there is absolutely nothing supernatural about such a crane. On the contrary, it's a very transparent and explainable source of complexity. Nevertheless, this "crane" is different from the physical "cranes" that Dawkins champions. We could call it a *deductive crane*. Dawkins needs to expand his notion of "cranes" to include deductive cranes along with physical ones.

Interestingly, some old traditions in Western theology seem to suggest that the complexity of God arises from a deductive crane of some kind. According to one long-standing theological hypothesis, God is a "necessary being," meaning that there could not have *not* been a God. There also is a theological tradition to the effect that God is "simple." This does not necessarily mean that God is devoid of all forms of complexity; most theologians think that God has several attributes, and having multiple attributes is a kind of complexity. Theologians understand the "simplicity" of God in various ways, but at bottom it seems to mean that God's attributes, however intricate, follow inevitably from something simple about God's nature. These ideas about necessity and simplicity sound like anticipations, from the days before modern mathematics, of the idea of deductive cranes that I have examined here. Plantinga has pointed out that if God is a necessary being, then God is *not* improbable [6]. Is this kind of necessity anything but a deductive crane? Could the idea of deductive cranes be used to flesh out the idea of a necessary being?

In *The God Delusion*, Dawkins touches on the ideas of necessary being and of simplicity, but he fails to deal correctly with either one. The idea that God is a necessary being is the driving idea behind the ontological argument for the existence of God. In the Appendix I will show how Dawkins mishandles this celebrated and puzzling argument. In another place, Dawkins relates a story of the time he presented his complexity argument to some theologians (pp. 153-154). The theologians replied with the claim that God is simple (p. 153). In the book, Dawkins summarily dismisses this claim. Perhaps the theologians should have hung pictures of fractals on the walls, and pointed out that a simple set of

facts can give rise to a very complex system indeed. Would Dawkins have listened?

An Afterthought: Agnosticism Rescued

My second and third objections to the argument from improbability also undermine Dawkins' argument against agnosticism (pp. 46-54). In this argument as in the airliner argument, Dawkins focuses on examples of improbable physical systems. The main example is Russell's famous teapot—a teapot alleged to be orbiting in outer space, outside the reach of direct earthly observation (pp. 51-52). Russell pointed out, and Dawkins concurs, that it is rational to disbelieve in such an object even though we cannot strictly disprove its existence. Dawkins uses this example, and several others like it (including the Flying Spaghetti Monster of Internet fame), to show that the existence of a made-up object for which there is no evidence is a highly improbable hypothesis, even if we cannot strictly disprove the hypothesis. From this foundation, Dawkins argues that we should believe God is improbable, instead of merely being undecided about God's existence as are most agnostics.

This argument against agnosticism falls apart once we realize that probabilities of objects depend on the details of natural laws. As I pointed out earlier, we cannot decide the probability of God's existence in the same way that we would decide the probability of a teapot or a monster. Russell's teapot is improbable because, *given known natural laws*, there is no reason why such a teapot should exist. Russell's teapot could only come into being, and be located where it is, through circumstances which, *given known natural laws*, are highly improbable. However, if we aren't even sure which laws (if any) govern the being we are interested in, then how can we estimate the being's probability? God is not like the teapot or the Flying Spaghetti Monster, because God (if there is one) might well be the source of natural laws and hence might not have a well-defined probability. We can't conclude that God is improbable by using the same reasoning that tells us

Russell's teapot is improbable.

Someone might try to get around this rebuttal of Dawkins by creating a new teapot or monster example in which the object is defined so that it doesn't have to obey natural laws. This desperate gambit will not work, because teapots and flying monsters, unlike the theists' God, are objects within the physical universe. Whatever else one can say of them, the teapot and the monster (if they existed) would be located in the same physical space as the rest of us. They have shapes, locations, and motions, and hence are inside the spacetime of the physical universe. Science has provided strong evidence that all objects in that spacetime obey the laws of physics. Thus, a teapot or a monster that does not obey the laws of physics is highly improbable. However, God (if there is one) might well not be an object in the physical universe, so a similar argument does not apply.

Dawkins' polemic against agnosticism also falls apart once we recognize the possibility of deductive cranes. If a set of simple, unavoidable laws (call this set L) implied the existence of a highly complex being of a certain type (call it a G-being), then we might be right to assume that a being of that type exists, even if we have no observational evidence for it. The question of the existence of a G-being would hinge on the question of the truth of the simple laws in L. If we found evidence that the laws in L were true, we then would know that a G-being existed, even without one shred of observational evidence for such a being. Thus, if an entity might arise from a deductive crane, we cannot estimate the probability of that entity in the same way that we would infer the improbability of a teapot or a monster. (Note that the laws in L need not be laws of physics. They might well be laws of mathematics, such as axioms of set theory, or general conceptual truths of the kind that interest philosophers.) [7]

A Dawkinsite might reply that a set of laws like L is improbable *because* those laws imply the existence of an improbably complex being (a G-being). However, this argument would be a shameful example of question-begging. If the laws L were true,

then the G-being would *not* be improbable. Hence the claim that a G-being is improbable presupposes the falsehood (or probable falsehood) of the laws L. It would be circular to use the supposed improbability of a G-being to show that the laws L are improbable. Of course, it might be true that a similar being would be improbable if it occurred under some other laws *besides* L. However, this fact does not decide the probability of a G-being's existence in the presence of L.

Needless to say, the whole idea of a deductive crane is irrelevant to the existence of Russell's teapot or of the Flying Spaghetti Monster. These objects, if they existed, would be physically interacting objects of middle size (neither quantum mechanically small nor cosmically large) within the physical universe. Based on what we know of the laws of physics, we can safely say that these objects might not have existed had things turned out differently in the universe. Thus, the complexity of such objects is far from inevitable, and it would be wrong to attribute that complexity to a deductive crane. The probability for these objects remains near zero, just where Russell left it. However, if there is such a thing as a deductive crane, then there could be other objects whose existence is *not* an improbable hypothesis, even in the absence of observational evidence for those objects. Of course, any rational belief in those objects would have to be supported by evidence of some sort. However, the evidence would not have to be observational evidence for an object. Instead, it could be evidence for the presence of a deductive crane. This evidence might (for all we know) consist of general information about natural laws, or even principles of mathematics, logic, or conceptual analysis.

What I have said here is not an argument for agnosticism, but a rebuttal of Dawkins' main argument against agnosticism. Dawkins' critique of agnosticism does not provide a good reason for any agnostic to become an atheist.

Appendix. Some Comments on Dawkins' Conception of God

[*Note:* This appendix was adapted from a May 18, 2009 post to the author's blog, *The Unfinishable Scroll* (http://www.eskimo.com/~msharlow/cgi-bin/blosxom.cgi).]

The most serious flaw in *The God Delusion* is that it misses the idea of God almost completely. Dawkins focuses on one particular idea of God: that of a supernatural creator of the universe, as presented in traditional theism and deism (pp. 11-15, 18-19, 31). He admits that he is trying to debunk only the supernatural idea of God (pp. 15, 31). The only other idea of God that Dawkins even considers is pantheism, which he equates to the poetic use of the word "God" to describe the physical universe or its laws (p. 18). By leaving the reader with only these choices, Dawkins bypasses the many well-considered philosophical conceptions of God that do not fit either of these categories. Thus, he cannot debunk these other ideas.

Dawkins begins this mistake by ignoring all forms of pantheism that do not fit his narrow definition of "pantheism." Dawkins' description of pantheism fits some versions of pantheism, but is grossly inaccurate for other forms. Among these other forms are the pantheistic viewpoints of Schelling, Heraclitus, and Bruno, and Eastern philosophies such as Advaita Vedanta. In various ways, these philosophies identify God or the divine with the whole of reality or with the underlying principle of the universe. However, they do not equate God to a universe regarded as a mere collection of material particles. Some forms of pantheism depict the mental and spiritual features of reality as real and significant—at least as significant as the physical features of the cosmos. Thus, they do not reduce God to a mere poetic name for the physical universe known to science.

Dawkins' handling of Spinoza is especially revealing. Spinoza probably is the best known of Western pantheists. His philosophy, born in the early days of modern science,

stressed the unity of nature and the immutability of natural law. Dawkins mentions Spinoza and notes that Einstein approved of Spinoza's idea of God (p. 18). However, this mention of Spinoza seems ironic, because Spinoza's pantheistic philosophy simply does not fit Dawkins' narrow definition of "pantheism." Spinoza identified God with nature, but he also held that nature has mental as well as physical properties [8]. According to Spinoza, the natural universe itself is not merely a physical system, but also is intrinsically spiritual. Spinoza's God is impersonal, but has mental and spiritual features, making it a bit more like a "someone" than a mere "something." After reading Spinoza's *Ethics*, it would be silly to equate Spinoza's pantheism to "sexed-up atheism"—which is Dawkins' characterization of pantheism (p. 18). Indeed, Spinoza himself denied that he would equate God to nature if nature were thought of as strictly material [9]. Spinoza's God is impersonal and natural, but is a real supreme being, not merely a sexed-up collection of lumps of matter. Despite the sharp differences between Spinoza's view of God and the standard Christian views, the Christian writer Novalis had good reason to label Spinoza "the god-intoxicated man" [10].

Besides neglecting most forms of pantheism, the book also ignores many other philosophical conceptions of God. There are ideas of God that portray God as something besides the physical universe, but that do not involve (or could exist without) belief in miraculous supernatural action. Some philosophers have proposed theories of God like this; offhand, the names of G. H. Howison, Charles Hartshorne and Aristotle come to mind [11]. Dawkins' polemic bypasses these ideas almost as if they did not exist. He simply sorts ideas of God into two bags—the supernatural, miracle-working creator from traditional religion (together with its simpler variant, the God of deism), and the poetically described material world with no real God. Any form of belief in God that doesn't fit into one of these two bags simply fades from view.

By ignoring all these philosophical conceptions of God, Dawkins forfeits any claim to have built a case against God. At most, he has shown that traditional Western religious

conceptions of God are inadequate. This does not imply atheism. At most, it implies that those who believe in the traditional version of God should either become atheists *or* adopt improved ideas about God. (Whether Dawkins has accomplished even this much is a separate topic.)

This slighting of non-supernatural ideas of God contributes to Dawkins' high-handed treatment of Stephen Jay Gould's NOMA concept (pp. 54-61). According to NOMA, science and religion each have their own areas in which they are authoritative. If NOMA is right, then religion should not dictate about matters in the area of science, such as evolution and cosmology, and science should not dogmatize about matters of the meaning of existence, which belong to religion. The NOMA idea is quite reasonable. It is close to what many liberal, modernist believers in God already believe. (If you think the Genesis story can't be literally true because it contradicts science, then you already are practicing NOMA to some degree.) Of course, most religions today do not obey NOMA. Instead, they postulate literal miraculous happenings that science might, in principle, be able to evaluate. Dawkins correctly recognizes this, and observes that a religion that follows NOMA would be quite different from most religions practiced today (p. 60). Dawkins could have taken this observation to some reasonable conclusion. For example, he could have claimed that today's religions need to be reformed and modernized, leading to liberal forms of religion that take miracle stories to be spiritual lessons instead of physical facts. Instead, he uses the occasion to rake NOMA over the coals. He even makes the nasty suggestion that Gould was insincere in his embrace of NOMA (pp. 57-58). To support this putdown of the brilliant Gould, Dawkins trots out the claim that Gould personally was skeptical of the existence of God (p. 58). Needless to say, Gould's personal belief or disbelief in God is totally irrelevant to Gould's sincerity in embracing NOMA. One can believe that religion is a legitimate field of study and still come to a personal decision to be an agnostic or an atheist in the field of religion. (It's much like studying a particular field of physics and finally embracing a theory that denies some commonly accepted concepts in that field. No insincerity required!) None of Dawkins'

overheated criticisms of NOMA cast any doubt on the rational acceptability of NOMA. Of course, making NOMA look bad is useful for Dawkins, because if NOMA were right his science-centered polemic against God might lose its grip.

The main line of argument in *The God Delusion* is an attempt to debunk supernatural concepts of God, especially those that involve supernatural creation or intervention. Because not all concepts of God require supernatural happenings or even a supernatural God, the book does not succeed in debunking God. It fails as a polemic for atheism. The most this book can do is undermine traditional religious conceptions of God, then leave us on our own to decide about the conceptions of God put forth by philosophers and reason-friendly religionists. Whether the book can do even that much is a separate question.

Why does Dawkins ignore almost all philosophical conceptions of God? It might be a symptom of a more general problem: a striking failure to handle philosophical ideas correctly [12]. One can catch a whiff of this failure at various points in the book. I'll give a few examples here.

In a discussion of traditional Christian ideas about the Trinity (p. 33), Dawkins refers to a teaching of Arius that makes use of the philosophical concepts of "substance" and "essence." Philosophers (including atheistic ones) are likely to have some idea of what these terms mean, for philosophers have thought about puzzles involving substance and essence since the time of the ancient Greeks. However, when Dawkins asks rhetorically what these terms mean, his answer is " 'Very little' seems the only reasonable reply" (p. 33). This is simply wrong. One can love or hate theology, but either way, the terms "substance" and "essence" do mean something. They are standard philosophical terms with real meanings.

Another example of bad philosophy (and also of substituting ridicule for thought) is

Dawkins' discussion of the ontological argument for the existence of God (pp. 80-85). This is a famous argument put forth by Anselm of Canterbury in the Middle Ages. Dawkins' treatment of this argument is both emotional and coarse. He calls the argument "infantile," and then gives a silly scenario in which children on the playground argue about God using some of same words used in the real argument (p. 80). Despite the tone of snide self-assurance in that passage, Dawkins gets the ontological argument wrong! Scholars have known for decades that Anselm wrote down at least two distinct versions of the ontological argument [13]. The first version was more or less preliminary; apparently Anselm himself was dissatisfied with it, for he presented a second version in the next chapter of his book. The second version is more sophisticated and is not nearly as vulnerable to attack. The full analysis of this second version requires modern techniques of logic. However, the version that Dawkins quotes is the *first* version (p. 81). It is pretty clear that his ridiculous playground scene also is based on this first version. As Hartshorne pointed out in 1965, many past philosophers made the mistake of critiquing the first version of the argument and ignoring the second [14]. However, there is no excuse for this mistake today; we simply know better. Dawkins either does not know or does not bother about the second version of the argument. He just goes ahead and quotes and ridicules the weak first draft of the argument, as if that were an effective attack on the ontological argument.

Toward the end of his attack on the ontological argument, Dawkins mentions the time he presented a bogus argument, resembling the ontological argument, to a meeting of philosophers and theologians. Dawkins says: "They felt the need to resort to Modal Logic to prove that I was wrong." (p. 84; capitalization in original). Read in context, this remark seems snide, as though forcing the philosophers and theologians to use modal logic were a gloating victory. Does Dawkins even know that modal logic is a respectable mathematical discipline, and that modal logic is necessary for the rational analysis of almost *any* argument about possible entities that might not be real? To me at least, the book gave no answer to this question.

Still another example of a crude approach to philosophy comes from Dawkins' discussion of mind-transfer scenarios (p. 180). Dawkins mentions two fictional stories in which people find that they have swapped minds, with the mind of one now existing in the body of the other. Dawkins claims, without much argument, that "the plot makes sense only to a dualist" and that such stories could happen in real life only if the personality is somehow distinct from the body (p. 180). A little philosophical reading shows that the truth is not so simple. In real life, philosophers have studied mind-transfer scenarios in great detail—and some *materialist* philosophers have seriously considered that they might be logically possible [15]. One can be a materialist, with no belief in a nonphysical mind, and still find it possible for the mind of person A to enter the body of person B. All one has to do is suppose that the two persons' brains are reorganized in a way that makes one of the brains continue the memories and conscious life of the other. Needless to say, this experiment would be an enormous feat in real life. Today's science is nowhere near being able to do it. However, this feat would be possible in principle even if dualism is false. If Dawkins offered any real argument for his opposite opinion on this topic, I might take his opinion seriously—but he offers no real argument.

These examples are far from my original topic of the idea of God. I mention them only to show that Dawkins' book contains some strikingly crude treatments of philosophical ideas. Perhaps this helps to explain why the most interesting ideas of God—the philosophically well-considered ones—are almost entirely absent from this book.

Notes

Page numbers for *The God Delusion* refer to the edition listed under "Works Cited," below.

[1] Sharlow, *God: the Next Version.*

[2] Plantinga (in "The Dawkins Confusion") has noted that the improbability of complex objects makes sense if materialism is true, but cannot be taken for granted if materialism is false. This objection of Plantinga's is akin to my argument here, but I think my argument would go through even in the presence of some kinds of materialism.

[3] I am using the words "complex" and "complexity" in their intuitive, prephilosophical senses. Perhaps we could rigorize these statements through the use of formal measures of complexity, but I won't attempt this here. I don't think this would change anything essential in my argument.

[4] For set theorists, I will mention that the axiom of infinity is not necessary for this step. ZF minus Infinity will do.

[5] See, for example, Sharlow, "Getting Realistic about Nominalism," and Sharlow, *The Unfinishable Book*, Talks 8 and 9.

[6] Plantinga, "The Dawkins Confusion."

[7] Plantinga, in "The Dawkins Confusion," makes a relevant observation: if God is taken to be a necessary being, then Dawkins' atheistic argument would require an argument against a "necessary being with the attributes of God". I think such an argument might amount to a philosophical argument about deductive cranes.

[8] Spinoza, *Ethics*. See especially Part 2 Proposition 7, including the following "scholium" or note, and Part 2 Proposition 13, especially the following note. Also see Durant, pp. 134-143.

[9] See the excerpt from Spinoza's letter, in Durant, p. 132.

[10] Quoted in Durant, p. 149.

[11] The works of Aristotle are well-known. Hartshorne's ideas are well-known too, within the rubric of "process theology." His idea of God is discussed in his several books. Howison also is important in the history of philosophy, but appears to be less

well-known than Aristotle and Hartshorne. His main work is *The Limits of Evolution and Other Essays*.

[12] I am not the first to comment on Dawkins' inadequate treatment of philosophical ideas. Plantinga has mentioned Dawkins' "jejune" and "sophomoric" handling of some philosophical matters (see Plantinga, "The Dawkins Confusion").

[13] See Hartshorne. The first version of Anselm's ontological argument is in Anselm's *Proslogium*, Chapter 2. The second version is in Chapter 3.

[14] Hartshorne, especially pp. 12-18.

[15] See Shoemaker, pp. 108 ff.

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[N.B.: Spinoza's *Ethics* comes in many versions. Durant's chapter on Spinoza is a valuable introductory discussion of this philosopher. See especially Section 2, "Matter and Mind."]