

IS INTELLIGENT DESIGN SCIENCE? DISSECTING THE DOVER DECISION

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Draft – comments welcome!

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Abstract

In the case of *Kitzmiller et al. v. Dover Area School District, et al.*, Judge Jones ruled that a pro-intelligent design disclaimer cannot be read to public school students. In his decision, he gave demarcation criteria for what counts as science, ruling that intelligent design fails these criteria. I argue that these criteria are flawed, with most of my focus on the criterion of methodological naturalism. The way to refute intelligent design is not by declaring it unscientific, but by showing that the empirical evidence for design is not there.

1. Introduction. In December 2005, U.S. federal judge John E. Jones III handed down his decision in the much-publicized case of *Kitzmiller et al. v. Dover Area School District, et al.* The ruling holds that it is unconstitutional for the Dover Area School District to require that a pro-intelligent design disclaimer be read to public school students during the course of teaching them evolutionary theory. Intelligent design isn't really explained in the disclaimer: all it says is that "Intelligent Design is an explanation of the origin of life that differs from Darwin's view" (Jones 2005, 2). For a more careful definition, consider this statement from the Discovery Institute:

The theory of intelligent design holds that certain features of the universe and of living things are best explained by an intelligent cause, not an undirected process such as natural selection. (Discovery Institute, 2006)

(I will have more to say about the exact content of the theory of intelligent design below.)

Jones's ruling holds that that intelligent design (ID) counts as religion, not science, and hence the teaching of ID in public school is unconstitutional. In Jones's 139 page decision, he gives an answer to the contentious demarcation question – what criteria can we use to demarcate science from non-science? I will argue that Jones's proposed demarcation criteria are fundamentally flawed. Most of my discussion will focus on the issue of methodological naturalism – I will argue that rejection of the supernatural should not be a part of scientific methodology.

The reason this matters is that it's a dangerous practice to try to impose rigid boundaries on what counts as science. For example, as I will show, a consequence of Jones's criteria is that the aim of science is not truth. While this may be the case, one would expect this to be established by philosophical argumentation about the aim of science (along the lines of e.g. van Fraassen

1980), not by a specification of demarcation criteria to distinguish science from pseudoscience. My position is that scientists should be free to pursue hypotheses as they see fit, without being constrained by a particular philosophical account of what science is.

For the purposes of this essay, I'm not really interested in whether it's constitutionally permissible for the Dover Area School District to read the disclaimer to their students. My personal opinion is that it shouldn't be done – not because it's constitutionally impermissible, not because intelligent design isn't science, but simply because reading such a disclaimer is bad pedagogy. But I am trained as a philosopher; I have no special insight as to whether ID should be taught in science class. More precisely, I have no specialized training which would help me to answer the following two questions: supposing ID counts as science, should it be taught in science class? Supposing ID does not count as science, should it be taught in science class? I do, however, have specialized training which will help me to answer the question of whether ID counts as science.

So does ID count as science? I maintain that it is a mistake to put too much weight on that question. Larry Laudan got the answer right:

If we would stand up and be counted on the side of reason, we ought to drop terms like “pseudo-science” and “unscientific” from our vocabulary; they are just hollow phrases which do only emotive work for us. (Laudan 1983, 349)

If our goal is to believe truth and avoid falsehood, and if we are rational people who take into account evidence in deciding what to believe, then we need to focus on the question of what evidence there is for and against ID. The issue of whether ID counts as “science” according to some contentious answer to the demarcation question is unimportant. Of course, on this approach it would be much harder to get a federal judge to rule that ID can't be taught in public school. But sometimes it is more important to be intellectually honest than to do what it takes to stop people from doing something you don't like.

2. Jones's Demarcation Criteria. In Jones's decision, he implicitly gives three necessary criteria for something to count as science. He maintains that ID fails all three:

We find that ID fails on three different levels, any one of which is sufficient to preclude a determination that ID is science. They are: (1) ID violates the centuries-old ground rules of science by invoking and permitting supernatural causation; (2) the argument of irreducible complexity, central to ID, employs the same flawed and illogical contrived dualism that doomed creation science in the 1980's; and (3) ID's negative attacks on evolution have been refuted by the scientific community. (Jones 2005, 64)

I find all three criteria unconvincing. The first criterion is the most promising one, so I'll have most to say about it. But I will start by taking issue with the third and second criteria.

2.1. The Scientific Community. Let's start with the third criterion, that ID's negative attacks on evolution have been refuted by the scientific community. There are two problems with this criterion.

Even if it is true that ID's negative attacks are wrong, that doesn't necessarily impugn ID's positive doctrines. Suppose that Theory A is in competition with Theory B, and suppose that the proponents of Theory A have given bad arguments against Theory B, arguments which have been refuted by the scientific community. This is compatible with Theory A being true, and moreover, this is compatible with there being good scientific evidence for Theory A. This is also compatible with there being good scientific evidence against Theory B – it could simply be that the proponents of Theory A picked the wrong arguments to give against Theory B.

Now, suppose that it's not only the case that ID's negative attacks have been refuted, but also that ID itself has been refuted. Even so, this doesn't make ID unscientific. Consider Newtonian physics – this is uncontroversially a scientific theory. Note that it counts as a scientific theory even though it has been refuted. (For example, Newtonian physics predicts that clocks in differing gravitational fields will run at the same rate, while it has been empirically shown that clocks in stronger gravitational fields run slower.)

One might be tempted to say that under the supposition that ID is false, we can at least conclude that it shouldn't be taught in public school. But even that doesn't follow: Newtonian physics is false, and yet that is the theory that everyone is taught in high school physics classes. (For more on this point, see Fitelson 2006.) I conclude that even if ID's negative attacks on evolution have been refuted by the scientific community, it doesn't follow that ID is not science.

2.2. Irreducible Complexity. Jones's second criterion is that the argument of irreducible complexity is flawed. Here Jones has in mind the arguments given by Michael Behe (1996). Behe argues that some biochemical systems are irreducibly complex: they have multiple parts, and they need all their parts to do anything. Behe claims that we wouldn't expect such systems to arise via evolutionary means, since random chance would have to bring all the parts together at once for the system to be functional; the existence of the system can't be accounted for via a step-wise evolutionary process.

This demarcation criterion is no good, and one way we can see that is by going back to the second point made just above. Just because an argument is flawed, it doesn't follow that the argument is unscientific. Scientists sometimes give flawed arguments, but they are still doing science when they do so.

This demarcation criterion is mistaken in other ways too. ID consists of more than Behe's argument from irreducible complexity. For example, there are physics-based arguments for ID, such as the fine-tuning argument, which have nothing to do with irreducible complexity. (According to the fine-tuning argument, some of the values of the fundamental constants in physics are fine-tuned for life, in the sense that if the values were slightly different life couldn't

exist. This arguably provides evidence for the existence of God. For more on this argument, see for example Monton 2006.) In addition to physics-based arguments for ID, there are also biology-based arguments for ID that have nothing to do with irreducible complexity. For example, one popular pro-ID argument is to claim that the origin of life from non-life is so improbable, it would take a miracle for it to occur. (See for example Strobel 2004, 37-42.)

2.3. Methodological Naturalism. We come now to the most promising of Jones's three criteria, the criterion of methodological naturalism. In this section I will grant that ID does postulate supernatural causation, and I will argue that that is compatible with it being scientific. In the next section I will argue that in fact ID is not inherently supernatural, and hence ID can count as science even if the restriction to naturalism is part of the scientific methodology.

I will now argue that it is counterproductive to restrict scientific activity in such a way that hypotheses that invoke the supernatural are ruled out. Specifically, I will argue that it is possible to get scientific evidence for the existence of God. The scenario I am about to describe is implausible, but there is nothing logically inconsistent about it. The point of the scenario is that in the described situation, it would be reasonable for scientists to postulate and test the hypothesis that there is supernatural causation occurring. (I am not the first to present this sort of scenario; for a related scenario, see Dembski 1992.)

Imagine that some astronomers discover a pulsar that is pulsing out Morse code. The message says that it's from God, and that God is causing the pulsar to pulse in this unusual way. The astronomers are initially skeptical, but they find that when they formulate questions in their head, the questions are correctly answered by the message. The astronomers bring in other people to examine this, and the questions are consistently answered. The message goes on to suggest certain experiments that scientists should perform in particle accelerators – the message says that if the experiments are set up in a specified precise way, then God will cause a miracle to occur. The experiments are done, and the resulting cloud chamber tracks spell out Biblical verses. Then the message explains to the scientists how to form a proper quantum theory of gravity...

I could go on, but you get the picture. The evidence doesn't *prove* that God exists – maybe some advanced alien civilization is playing a trick on us; maybe the scientists are undergoing some sort of mass hallucination; maybe all this is happening due to some incredibly improbable quantum fluctuation. But the evidence does provide some support for the hypothesis that God exists. It would be silly for the scientists to refuse to countenance the hypothesis that God exists, due to some commitment to methodological naturalism. Of course, it is important to consider the naturalistic hypotheses, but one has to consider the theistic hypothesis as well.

Note that the theistic hypothesis here is testable. For example, when the message tells the scientists that they will get a miraculous result from certain experimental setups, the scientists are testing the hypothesis the pulsar message is from God. If the experiments had not resulted in any unusual data, this would

provide disconfirming evidence for the hypothesis that the message is from God. Hence, the fact that the experiments do result in unusual data provides some confirming evidence for the hypothesis that the message is from God. (The probability shift in favor of the hypothesis that the message is from God may be small, but the point is just that the unusual data does count as confirming evidence.)

The fact that the theistic hypothesis here is testable shows that some of the expert testimony that Jones relied on in formulating his decision is flawed. Specifically, philosopher of science Robert Pennock claims, in his expert report, that “Supernaturalism is not allowed” in science, “because it is not testable” (Pennock 2005a, 11). I have given a counterexample to that line of reasoning, by presenting a situation where a supernatural hypothesis is testable.

Jones, in support of his demarcation criterion of methodological naturalism, cites the definition of science from the prestigious National Academy of Sciences:

Science is a particular way of knowing about the world. In science, explanations are restricted to those that can be inferred from the confirmable data – the results obtained through observations and experiments that can be substantiated by other scientists. Anything that can be observed or measured is amenable to scientific investigation.

Explanations that cannot be based upon empirical evidence are not part of science. (in Jones 2005, 66)

Just after this quote, Jones says that “This rigorous attachment to ‘natural’ explanations is an essential attribute to science by definition and by convention.” But in fact the NAS definition never makes reference to “natural” explanations – there is no restriction to naturalism at all in their definition. In my hypothetical scenario described above, the supernatural explanation is based on empirical evidence, evidence that is obtained through observations and experiments that can be substantiated by other scientists. It follows that, on the NAS definition of science, supernatural explanations are in principle allowed, and hence it is illegitimate for Jones to appeal to their definition to support his demarcation criterion of methodological naturalism.

I don’t know how Jones would respond to my argument against methodological naturalism based on the pulsar example, but I do have evidence for how Pennock (also a supporter of methodological naturalism) would respond. At the end of Pennock’s expert report, he writes: “if someone were to find a way to empirically confirm the existence of an immaterial designer or any other supernatural being, science should change its methodology” (Pennock 2005a, 29). Pennock might then say that my pulsar example is one where the existence of a supernatural being has been empirically confirmed, and that in that situation science should change its methodology.

There is a problem with this idea that science should change its methodology in light of empirical confirmation of the existence of a supernatural being. How does this empirical confirmation take place, if not scientifically? By Pennock’s lights, there must be some other epistemic practice that one can engage

in where one can get empirical evidence for some proposition. What epistemic practice is this, and why doesn't it count as science? Pennock doesn't say. Also, note that the scientific status of that epistemic practice will presumably shift: at a time before one gets the empirical evidence that a supernatural being exists, the epistemic practice is unscientific, but after one gets that empirical evidence, the methodology of science changes in such a way that the epistemic practice (presumably) counts as scientific.

By Pennock's lights, it is possible for ID to count as science. All the ID proponents need to do is to provide enough evidence to confirm that there is a supernatural being – then scientific methodology will no longer include methodological naturalism. Thus, given that scientific methodology can change in light of new evidence, the debate over whether ID counts as science hinges on the debate over whether there is empirical evidence that confirms the existence of a supernatural being. I am happy with this result, because this latter debate is the one that is interesting and important. We shouldn't get caught up debating whether ID counts as science; the focus should be on the empirical arguments for and against ID.

To sum up, I reject Pennock's claim that science should change its methodology if the existence of a supernatural being is empirically confirmed – but even if Pennock's claim is correct, it is possible that ID can still count as science. Now, I will turn to the final issue of this section, the issue of whether there is a consensus in the scientific and philosophical communities that methodological naturalism is a constraint of science. Jones's judgment reads as if there is a consensus, while I maintain that there is not. I can understand why Jones would think that there is a consensus, since expert witnesses for the plaintiffs testified that there is, and the defense didn't do an adequate job refuting that.

First, I will examine whether there is a scientific consensus in favor of methodological naturalism. The most straightforward approach here would be to do an opinion poll of scientists, but (as far as I can tell) no one has done that. Pennock (2005a, 11; 2005b, 28-9) argues that there is such a scientific consensus by citing a literature search – nowhere in the contemporary scientific literature could he find scientists appealing to the supernatural. After he describes this literature search during his direct examination, this exchange follows:

Q: So methodological naturalism is basic to the nature of science today?

A: As I said, I could not find an exception to that.

Q: And the rule is well accepted in the scientific community?

A: That's right. (Pennock 2005b, 29)

There is a problem with the line of reasoning that goes from the results of the literature search to a conclusion about accepted scientific methodology. Just because there are no appeals to the supernatural in current scientific literature, it in no way follows that such appeals are excluded on methodological grounds. Consider the following parallel situation: a literature search will show that there is no postulation of the existence of an elementary particle with mass 1.73615 times that of the electron. But it in no way follows that the postulation of such a particle is excluded on methodological grounds. The reason that such a postulation

doesn't appear in a literature search is that there's no evidence for such a particle. I maintain that one can find no postulation of the supernatural for the same reason.

Since I don't have the resources to do an opinion poll, I will simply cite some counterexamples to the proposition that all scientists endorse methodological naturalism. Of course, scientists who are proponents of ID, like biochemist Michael Behe, reject methodological naturalism, but even some scientists who are opponents of ID reject it as well. For example, physicist Mark Perakh, in his anti-ID book *Unintelligent Design*, writes:

a definition of science should not put any limits on legitimate subjects for the scientific exploration of the world. Indeed, although science has so far had no need to attribute any observed phenomena to a supernatural cause, and in doing so has achieved staggering successes, there still remain unanswered many fundamental questions about nature. ... Until such answers are found, nothing should be prohibited as a legitimate subject of science, and excluding the supernatural out of hand serves no useful purpose. (Perakh 2004, 358)

I conclude that it is not evident that there is a consensus by scientists in favor of methodological naturalism.

Now, I will turn to the issue of whether there is a consensus by philosophers of science that methodological naturalism is a constraint of science. During Pennock's cross-examination, he was asked the following question:

Q: Dr. Pennock, isn't it true that there's not agreement among philosophers of science concerning the validity of methodological naturalism?

Pennock implies that only philosophers of science who are sympathetic to ID reject methodological naturalism:

A: The term methodological naturalism is fairly straightforward in the literature. There have been criticisms of it from people like Del Ratzsch from discussions specifically of this debate. So there's some who have taken up a sympathetic position to the intelligent design folks and tried to argue that we could dispense with this. (Pennock 2005b, 84)

Larry Laudan (1983) is a good counterexample to this: he is not sympathetic to ID, yet he rejects methodological naturalism as a demarcation criterion for science. (This follows from the sentence from Laudan's paper I quoted in Section 1, as well as from the rest of Laudan's paper.) Later in cross-examination, the defense asks Pennock about Laudan. After Pennock says that he is familiar with Laudan, he is asked:

Q: And Larry Laudan said he believes that creationism is science, it's just bad science, correct?

Pennock's response to this question takes up three pages of the trial transcript. In my opinion, Pennock misleadingly implies that Laudan would endorse methodological naturalism. Pennock says that if creationism is understood as a naturalistic hypothesis (focusing on its naturalistic implications about the age of the Earth, for example), then it is bad science, but if it is understood

supernaturalistically, then it is not science at all. Pennock doesn't explicitly attribute this view to Laudan, but someone who hadn't read Laudan would probably come away thinking that this is Laudan's view. For example, Pennock says:

If you seriously take the supernatural possibility, then you can't disconfirm it. So that's the sense in which it's important to say under the assumption of methodological naturalism, we have disconfirmed it, it's bad science, that's what Laudan is talking about, but if you were to take seriously the non-natural part, that's to say rejecting scientific method, then it's just not science... (Pennock 2005b, 104-5)

Now, what the defense should have done here is pushed Pennock to clarify, to make clear to Jones that Laudan does not endorse methodological naturalism. But in fact the defense responds to Pennock's three-page answer with the following:

Thank you, Your Honor. I have no further questions. (Pennock 2005b, 105)

The defense dropped the ball: it would be reasonable for Jones to conclude on the basis of this cross-examination that (except for a few supporters of ID) philosophers of science agree that that methodological naturalism is a constraint of science.

Of course, Laudan is not the only philosopher of science who rejects methodological naturalism. I'll cite just one more example, that of anti-ID philosopher Niall Shanks. Shanks *says* that he endorses methodological naturalism, but he gives a nonstandard account of methodological naturalism, an account proponents of ID would be pretty happy with:

The methodological naturalist will not simply rule hypotheses about supernatural causes out of court ... But the methodological naturalist will insist on examining the evidence presented to support the existence of supernatural causes carefully methodological naturalists do not rule out the supernatural absolutely. They have critical minds, not closed minds. (Shanks 2004, 141-2)

I conclude that it's not the case that there's a clear consensus in favor of methodological naturalism (when understood to rule out appeals to the supernatural) in the scientific or philosophical communities.

3. ID is Not Inherently Theistic. Let's suppose that the above arguments are incorrect, and that in fact methodological naturalism is a demarcation criterion for science. I will now argue that this does not entail that ID is unscientific, since ID is not inherently supernatural.

It is true that most – perhaps all – proponents of ID are theists, and it's true that they sometimes say things that imply that ID has supernatural consequences. For example, Jones, in his decision (2005, 67), quotes defense witness Steve Fuller, who referred in his expert report to "ID's rejection of naturalism and commitment to supernaturalism". Pennock (2005a, 25) emphasizes in his expert report that "ID is inherently theistic", and the bulk of Barbara Forrest's lengthy expert report is devoted to arguing that "Anti-naturalism is an

integral part of ID” (Forrest 2005, 1). Jones agrees with these assessments, and that it why he maintains that ID fails the methodological naturalism demarcation criterion.

“ID” means different things to different people, and while some view it as essentially committed to supernaturalism, others do not. What this really boils down to is a terminological issue. In the official formulations of ID that proponents give nowadays, they are careful to avoid any commitment to the supernatural. For example, the Discovery Institute definition I cited in Section 1 simply says that “The theory of intelligent design holds that certain features of the universe and of living things are best explained by an intelligent cause”¹, without specifying whether that intelligent cause is natural or supernatural. If opponents of ID insist that that definition is a misrepresentation of ID, since ID is inherently theistic, then the natural response is to put a new doctrine on the table, ID*: “The theory of intelligent design* holds that certain features of the universe and of living things are best explained by an intelligent cause.”

It should be clear that ID* is not inherently theistic. The intelligent cause could be God, but it need not be. It may be that living things on Earth were created by a highly intelligent alien civilization, as Raelians believe.² It may be that the whole universe we experience is really just a computer simulation being run by highly intelligent non-supernatural beings, as Nick Bostrom (2003) argues is plausible. It takes just a bit of creativity to come up with other possibilities as well.

Proponents of ID (construed supernaturalistically) are also proponents of ID*. It follows that the vast majority of proponents of ID* are theistic – they maintain that the intelligent cause is a supernatural God. But it in no way follows that ID* itself is committed to supernaturalism. ID* is a disjunctive theory – one possibility is that the intelligent cause is supernatural, but the other possibility is that the intelligent cause is natural. Just because most proponents of ID* endorse one of the disjuncts, it in no way follows that the theory itself is not disjunctive.

I have introduced this ‘ID*’ terminology to placate those who say that ID is inherently theistic. But my definition of ‘ID*’ is the same as the definition of ‘ID’ that for example the Discovery Institute endorses. I recommend that, to avoid terminological messiness, we simply take proponents of ID at their word that the doctrine they are endorsing is the doctrine that I’ve called ‘ID*’. It follows that ID is not inherently theistic.

4. Science and the Pursuit of Truth. If science really is permanently committed to methodological naturalism, it follows that the aim of science is not generating true theories. Instead, the aim of science would be something like: generating the

¹ For simplicity I will focus on the positive part of their doctrine, ignoring the “not an undirected process such as natural selection” part.

² For more information on the Raelians, see for example <http://religiousmovements.lib.virginia.edu/nrms/rael.html>.

best theories that can be formulated subject to the restriction that the theories are naturalistic. More and more evidence could come in suggesting that a supernatural being exists, but scientific theories wouldn't be allowed to acknowledge that possibility. Imagine what might happen in my pulsar message scenario – long after overwhelming evidence has convinced everyone that supernatural causation is occurring, scientists would still be searching for naturalistic causes. The scientists themselves may agree that the causes are supernatural, but, because they are subject to the constraint of methodological naturalism, they are not allowed to postulate such causes while doing science. Science would rightfully be marginalized – what is the point of spending all these resources investigating naturalistic causes, long after it is evident that the causes are supernatural? I'm not saying that society would want to completely stop investigating the possibility of natural causes, but by failing to countenance the possibility of supernatural hypotheses in the pulsar scenario, scientists would be missing out on a potential revolution in our understanding of the world.

Jones seems aware of the fact that his demarcation criteria entail that the aim of science is not truth. He writes that “while ID arguments may be true, a proposition on which the Court takes no position, ID is not science” (p. 64). But if science is not a pursuit of truth, science has the potential to be marginalized, as an irrelevant social practice. If lots of evidence comes in against naturalism, investigation of the world that assumes naturalism has the potential to become otiose. Given the commitment to methodological naturalism, the success of science hinges on the contingent fact that the evidence strongly suggests that naturalism is true.

I maintain that science is better off without being shackled by methodological naturalism. Our successful scientific theories are naturalistic simply because this is the way the evidence points; this leaves open the possibility that, on the basis of new evidence, there could be supernatural scientific theories. I conclude that ID should not be dismissed on the grounds that it is unscientific; ID should be dismissed on the grounds that the empirical evidence for its claims just isn't there.

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Note: All trial documents are from Case No. 04cv2688 in the United States District Court in the Middle District of Pennsylvania; they are available at http://en.wikipedia.org/wiki/Kitzmiller_v._Dover_Area_School_District_trial_documents

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