

# Is Intelligent Design 'Scientific'?

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*Minds in the Making*

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The majority of modern arguments for Intelligent Design fall into one of two categories:

First: That **biological complexity** (that is, the development of first life, plus some subsequent increases in complexity during biological history) cannot be explained via natural evolutionary mechanisms alone, and is best explained in terms of the actions of some intelligent agent. Sometimes, attempts are made to formalize this claim via probability arguments.

The second common argument for ID is that the fundamental laws of nature appear to be **finely tuned** for life. This argument is typically left as an intuitive appeal, without attempting any formal probability calculations.

I have been asked to discuss whether or not arguments like these should be considered "scientific." The answer is: both Yes and No.

I have found that the least productive arguments over ID have been the arguments over whether or not Intelligent Design is "scientific." These arguments have been so unproductive, I believe, because Intelligent Design, as a whole package, is partly scientific, partly philosophical, and, yes, partly religious. So rather than debating whether or not ID as a whole should be entirely included in, or entirely excluded from, science, the real questions we should be asking are: Are the scientific parts of ID good science? Are the philosophical parts of ID good philosophy? And are the theological part of ID good theology?

I'll discuss the philosophical and religious aspects of ID towards the end of this talk, but let's start with the science. I think it's useful to have a broad picture of science which includes at least all of the questions I list under point **B** on the [handout](#).

**B.** A broad picture of science includes:

(B1) **The basis for science:** Can we discover new truths about nature? If so, how and why are we able to do so?

(B2) **The processes of science:** What are effective scientific methods for learning about nature?

(B3) **The discoveries of science:** What do we learn about nature when we apply these methods?

(B4) **The inferences of science:** Do scientific discoveries have implications for society, philosophy, religion?

(B5) **The human aspect of science:** What are our motives, ethics, and goals for doing science?

Questions B2 and B3 - which ask, "What are effective scientific methods for learning about nature," and "What do we learn about nature when we apply those methods" - these questions typically are answered by scientists with little or no input from philosophy or religion or other academic disciplines. And that is probably the way it should be. But the other questions I list, about the basis for science, the societal impact of science, and our motives and ethics and goals for science - those questions are properly asked by scientists in conjunction with other disciplines, including philosophy and religion.

Imagine telling an historian that the discipline of history should devote itself exclusively to discovering raw facts about the past - what events happened, where, and when - but all questions about the psychological, social, philosophical, and religious implications of historical events, those questions belong outside the discipline of history, and should be excluded from professional historical scholarship.

If you said that to any historian, I imagine that the historian would laugh you to derision. History overlaps with other disciplines, and it is appropriate for historians to speak on these areas of overlap.

In the same way, scientists who feel motivated and competent to do so should not be shy about addressing questions where science overlaps with sociology, philosophy, and religion.

*However*, although a broad definition of science can be useful, it's also useful to acknowledge that there is a narrower definition of science, which is what most people today think of when they hear the word "science," which restricts itself to questions B2 and B3, and which acknowledges the critical role in science of constructing and testing explanatory models which only refer to natural causes. If we look at the history of science, we see that science really began to make progress when we stopped thinking about natural events in terms of "nature spirits" or in terms Aristotelian "final causes," and started trying to explain

events in nature exclusively in terms of immediate, natural causes. Historically, this has been critical for the advance of science. Now, it might sound like I'm trying to exclude Intelligent Design from science with this narrower definition.

But please note that I do not say that science must ever and always restrict itself to naturalistic explanations. I am only saying that models which restrict themselves to natural causes play a critical role in science. Advocates of ID should agree, because they themselves routinely construct models which restrict themselves to natural causes, as a step towards trying to show that such models are inadequate.

So, what happens when scientists confront a puzzling event in nature, and try to explain that event using models which only rely on known natural mechanisms? Well, these models are tested, and can meet varying levels of success, which I list under point D in the handout.

(D1) **Explainable.** Good empirical models predict that known natural mechanisms can explain the event.

(D2) **Partially explainable.** Our empirical models are not sufficiently thorough to explain the event entirely. However, based upon what we know so far, we believe that known natural mechanisms are sufficient to account for the event. We believe that future advances will allow us to explain the event fully.

(D3) **Unexplainable.** No known natural mechanisms can explain this event. In fact, there are good, empirical reasons for ruling out any model which relies only on known natural mechanisms.

Many things in science are now in category D1 - explainable in terms of known natural laws. For example: the regular orbital motion of planets, the fuel source for the sun, how cold fronts cause rainfall, and so forth. Perhaps the majority of things in science fall into category D2: partially explainable. How did the first galaxies form? How can a tree grow from a single seed into a mature plant? How does a bird learn when and where to migrate?

We know some of the mechanisms in these processes. But we know that we don't know other mechanisms. We expect that future research will turn up some interesting facts, concepts, and surprises. However, although we can only partially explain these things right now, it looks to us like known natural mechanisms will do the job. We don't expect that further research into these questions will turn up anything which just can't be explained in terms of known natural processes.

Scientists spend most of their time trying to move things from category "partially explainable" to the category "fully explainable." Scientists make models, trying to explain those events in terms of understandable natural processes. Scientists test their models experimentally and theoretically, and usually

they find that their models don't match the data. Very occasionally, when there are strong theoretical and experimental reasons, this leads scientists to hypothesize new natural laws which are consistent with known natural laws. But most of the time, scientists who confront a failed scientific model go back to work and make better models using just known natural mechanisms. This is how we make progress in science, most of the time.

But there are those rare occasions in science when an event seems to fall into category D3: unexplainable. Not only are we currently unable to construct a model of the event in terms of known natural laws, but we can even come up with good quantitative arguments why any model which relies only on known natural laws would seem to be excluded. An historical example of this is the period in the late 1800's when the energy source of the sun was a mystery. At that time, there was good evidence that the earth, and therefore the sun, was at least hundreds of millions of years old. But the known energy sources of chemical burning and gravitational collapse could be shown to be inadequate to fuel the sun for that long a period. The energy source of the sun was unexplainable in terms of natural mechanisms known at that time. The solution to this puzzle was the discovery of an entirely new natural process - nuclear fusion.

Today, the source of the Big Bang falls into the category D3: unexplainable in terms of known natural laws. Now, scientists can and do hypothesize new natural laws, acting in some primordial vacuum or mother universe, which might cause a Big Bang. This is an ongoing area of research. However, there are no currently known natural laws, for which we have independent evidence, which could explain the source of the Big Bang.

What do scientists do when confronting an "unexplainable" event? Individual scientists could reach one of many different conclusions about the cause of a scientifically unexplained event. I list five on the handout under point E: unknown natural law, supernatural event, super-human event, improbable event, or improbable event in one of many universes.

(E1) An as-yet **unknown natural law** is responsible for the event.

(E2) A **supernatural** event occurred. (The event was caused by an intelligent being of an entirely different reality than our universe.)

(E3) **Super-human technology** brought about the event. (The event was caused by intelligent beings who are contained in and limited by our universe, but with superior technology.)

(E4) A very **improbable** event simply happened.

(E5) There are **many universes**, and we just happen to live in one where this improbable event happened.

Again, consider the source of the Big Bang, combined with the apparent fine-tuning of fundamental laws of nature, which are currently unexplainable in terms of known natural laws. A search through popular books and articles written by scientists will turn up examples of each of these five types of conclusions listed under point E.

Although these five conclusions are very different from each other philosophically and religiously, empirical science alone distinguish among the five. When someone selects one of these five options as being the most likely one, that selection goes beyond the narrow definition of science, and is based in part upon philosophical, historical and religious considerations.

We could examine several other historical and modern scientific puzzles which at least some scientists claimed were scientifically "unexplainable." But to save time, let's skip over those and focus on the puzzles of most interest to Intelligent Design.

These puzzles are: the formation of first life on earth, and some subsequent increases in complexity during biological history. The majority of scientists, myself included, believe that development of first life and of biological complexity belong in category D2 - partially explainable. There are many steps - perhaps some very important steps - which we do not understand in detail because the problem is so difficult; but we expect that the development of life and biological complexity ultimately will be explainable in terms of natural mechanisms.

However, there are some people who think that the formation of first life, in particular, belongs in category D3: unexplainable in terms of known natural laws. And again, a survey of popular literature shows all of E1 through E5 have been proposed to explain the formation of first life on earth.

So now we have a situation where some people believe that biological complexity should be considered "partially explainable," and some believe that it should be considered "unexplainable." How do we make progress?

We make progress the way we always do in science: by trying to construct models for the phenomenon which rely only on known natural mechanisms. We then test those models, theoretically and experimentally. Advocates of evolution try to show that biological complexity belongs in category D2, partially explainable, by arguing that the best naturalistic models for the evolution of complexity, while of course incomplete, are compatible with the known data and suggestive of how to make progress. Advocates of ID try to show that biological complexity belongs in category D3, unexplainable, by arguing that the best

naturalistic models for the evolution of complexity are incompatible with the known data. All scientists on both sides are doing just what they are supposed to do: coming up with competing models, testing them, seeing which ones work and which ones don't.

So here's my first answer to the title of this talk: Advocates of Intelligent Design are doing science when they try to show that some phenomenon belongs in the category of "unexplainable," that is, when they attempt to show that conventional evolutionary models, which rely only on known natural mechanisms, do not match the data in some respects. When they do this, they are definitely doing science, even under a narrow definition of science. Their arguments might be good, solid scientific arguments, or they might be poorly done, flawed scientific arguments, but they are science.

Whenever someone, like advocates of ID, makes the argument that something is "unexplainable in terms of known natural mechanisms," they face the special challenge of being as thorough as possible in accounting for known natural mechanisms. Failure to be thorough is one of the easiest ways to make flawed scientific arguments. Let me give you some simplified examples.

We could imagine a warm pond of water with various simple molecules dissolved in it in various concentrations, and then calculate the probability that the right molecules will just randomly collide together, all at once, to spontaneously form a living cell. The probability of that happening is extremely low. Now, if we were to conclude on the basis of this calculation that first life on earth probably didn't form via that mechanism, that would be a solid scientific conclusion. But if one were to conclude on the basis of this model that first life on earth probably didn't form via any natural mechanisms, that would be a flawed scientific conclusion. Scientists who are researching the origin of life long ago rejected the idea that the first cell was formed via a single, random collision of millions of molecules. Scientists today have other natural mechanisms in mind for the origin of first life, and if you are going to attempt a meaningful probability calculation, those other mechanisms need to be studied and taken into account.

Another illustrative example: Suppose one is trying to make an argument about biological complexity based on the concept of "information." It turns out that the idea of "information" has been defined in a number of different ways, in different contexts. You need to be careful how you define and use the term. One definition of information has to do with how many bits of information are required to describe an environment. A simple environment requires only a few bits of information to specify, while a complex environment requires many bits.

Now, under the right conditions, a combination of deterministic laws plus random processes can change a simple environment into a complicated environment. So under one definition of information, it really is possible to produce new information, *de novo*, via a combination deterministic and random processes. This

can be simulated on computers, and it happens all the time in the real world in various physical processes. A second definition of information refers not to the environment as a whole, but to how many bits of information are required to specify an object within an environment.

Now it is possible, under the right circumstances, to have simple components self-organize into a more complex object via a combination of deterministic and random processes. But under this second definition of information, it can be argued that the deterministic and random processes are not producing new information, but rather, the information required for self-organization is already contained in the fine-tuning of the deterministic and random processes themselves. Yet a third definition of information refers not to the total information required to describe an object, but only to the genomic information in a self-replicating object like a biological cell. It measures how much genomic information the self-replicator requires to survive and reproduce in a particular environment. Again, there are circumstances under which the genomic information in a self-replicator can increase through processes of mutation and natural selection. But in this case, it's probably fair to say that the increased genomic information was not created *de novo*, but transferred from the complicated environment into the self-replicator.

So we see from these examples that if a researcher wants to have sound scientific conclusions about information, when it increases and when it does not, she will need to be careful in how she defines and uses critical terms such as "information."

One more illustrative example: The simplest version of biological evolution - and this is how evolution is often presented in the popular literature - looks something like this: each gene only produces a single protein; each protein only has a single function in the cell; the only kinds of mutations are point mutations; and the only way in which a mutation can be fixed in a population is through natural selection. Now, we can build a mathematical model of evolution using just that limited set of natural mechanisms, and we can calculate that, under those conditions, the evolution of certain kinds of biological complexity - the kind which Michael Behe called *irreducible complexity* - is extremely improbable. On the basis of this model, a solid scientific conclusion would be that biological complexity probably didn't evolve via that limited set of mechanisms. A flawed scientific conclusion would be to claim, on the basis of the model I just described, that this model proves that biological complexity cannot evolve at all. We know that biological evolution is a lot more complicated than the simplified model which I just presented. A more thorough model of evolution would include an accounting of all the natural mechanisms I list under point F2 in your handout, plus others mechanisms I haven't listed.

Biology is complicated. There are lots of natural mechanisms to consider, and we don't fully understand many of them. Given how much we have yet to learn about the mechanisms of evolution, it seems to me

that two limited types of scientific conclusions are accessible to advocates of ID. The first type would be: "On the basis of specific models with well-defined assumptions, we can rule out certain limited sets of natural mechanisms as being adequate, by themselves, to account for first life or to account for specific examples of biological complexity. Any evolutionary account will need to make use of additional natural mechanisms that aren't included in our initial models."

On the handout, I give a recently published example where I think the authors did a good job of specifying their models and their assumptions at the outset of the paper, and reached just that sort of limited conclusion. There is a second type of scientific conclusion which I think is defensible. An advocate of ID could say, "It seems to me (that is, it is my scientific intuition) that once all natural mechanisms are accounted for in detail, we will be able to show that first life and certain types of biological complexity (*e.g.* . bacteria flagella) truly are unexplainable in terms of all known natural mechanisms. We can't prove it for sure right now, but I believe that is where the data is pointing."

These are conservative claims, but given our current state of knowledge, it seems unwise for advocates of ID to claim that current scientific evidence warrants anything stronger. But please note, advocates of evolution should make similar sorts of restrained conclusions. One type of conclusion which an advocate of evolution could reach is: "Using known natural mechanisms, we can construct plausible models for certain specific examples of biological complexity."

If I had time, I would give you an example from neuroscience. Certain types of ion channels display biochemical interlocking complexity, and we can construct a fairly plausible model for their evolution via gene duplication. But if you want a more details, you'll have to ask me after this talk. This isn't a claim that we currently can explain all biological complexity, only that we can currently explain certain specific instances of biological complexity.

There is a second type of restrained conclusion which an advocate of evolution could make: "It seems to me (that is, it is my scientific intuition) that once all natural mechanisms are accounted for in detail, we will be able to show that first life and all types of biological complexity can be explained in terms of known natural mechanisms. We can't prove it for sure right now, but I believe that is where the data is pointing."

If advocates of ID and advocates of evolution could limit themselves to these sorts of restrained statements, when they make public pronouncements to general audiences, I think we could avoid a lot of the emotional heat which sometimes accompanies these debates.

In my remaining time, I'll talk briefly about philosophical and religious aspects of Intelligent Design. On my handout under point G, I've listed a variety of arguments, paraphrased from the writings of advocates of ID, which go beyond narrowly defined science and overlap into philosophy.

(G1) When we see **an event which had a very low probability of happening *and* for which there could plausibly be a beneficiary**, we generally conclude the event was planned and executed by an intelligent agent.

(G2) Taking into account various philosophical, historical, and religious arguments, **the most likely explanation for the fine-tuning of natural laws** is that they were supernaturally planned.

(G3) If we can show that **first life/biological complexity is unexplainable (highly improbable) in terms of known natural mechanisms**, we will have proven that it was brought about by an intelligent agent.

(G4) If we can show that **first life/biological complexity is unexplainable (highly improbable) in terms of known natural mechanisms, then if we also take into account various philosophical, historical, and religious arguments**, the most likely explanation is that it was brought about by a supernatural agent.

(G5) "Intelligent Design" is a very good term to associate (equate?) with **the idea that biological complexity is unexplainable in terms of natural evolutionary mechanisms**.

I think some of those arguments are good. For example, I think G1 is generally true and - while not a rigorous proof - I think it adds weight to ID arguments. Similarly, I agree with statement G2, which says that supernatural planning seems to be the strongest explanation for the fine-tuning of natural laws. The two main contenders for explaining the fine-tuning of the laws of nature are supernatural-creation and many-universes. But I don't think that many-universes really "solves the problem" of fine tuning. If there is some sort of mother universe which has a physical process that spawns off lots of baby universes, of which our universe is just one, then it seems to me - just speculating here - that the laws of nature probably would need to be finely tuned in that mother universe.

But of course the main reason that I think the laws of nature were created by God is that I believe Christianity is true. As I noted before, when you have a scientifically unexplainable event and are trying to decide which option, among E1 through E5, you think is most likely to be true, it is appropriate, and even inevitable, that your worldview beliefs play a role your selection.

Therefore, I think that all of the historical and experiential and philosophical arguments which can be given in favor of theism in general, and Christianity in particular, add weight to the idea that the laws of nature

were supernaturally planned. To put it more simply, because I believe in the God of the Bible, I am also inclined to believe that the best over-all explanation for our scientific observation of the fine-tuning of natural laws is that those fundamental laws of nature were designed by God.

I do disagree, however, with argument G3 the way it is phrased, since it makes a strong claim about proving the activity of an intelligent agent. I've already noted that events which are scientifically unexplainable allow for multiple explanations, not just intelligent agent activity.

The claim that scientifically improbable complexity must be due to intelligent agent action is, I think, particularly vulnerable to a version of the many-universes argument which notes that we now have some pretty good evidence that the actual universe started by our Big Bang, a universe which contains atoms and stars and galaxies all obeying the same laws of nature as our own universe, is probably much bigger than our visible universe.

However, if you rephrase G3 to something like statement G4, then I would be inclined to agree with it. Theologically, I believe that it is possible that God chose to design the laws of nature in such a way that certain kinds of biological complexity could not evolve, and then acted at certain points during biological history to overcome those limitations and assembled those complexities. So if biological complexity is ultimately shown to be unexplainable in terms of known natural laws, then because I believe in the God of the Bible, I would be inclined to attribute biological complexity to God's miraculous activity.

I understand that some advocates of ID would like to have argument G3 classified under the rubric of "science" rather than "philosophy." While I agree that G3 falls under science-defined- broadly , it is still the case that arguments like G3 fall outside of science-defined- narrowly , as most people understand the term "science" today. You should take comfort in the fact that the demarcation lines between science and philosophy have shifted from time to time throughout the history of science. If biological complexity defies evolutionary explanation and if ID become a useful rubric for guiding empirical studies of biology - in other words, if lots of scientists start to find ID useful for doing their science - then the demarcation lines around science will evolve to encompass ID.

But in the meantime, my advice is to be patient. Be content for now to have arguments like G3 discussed under the heading "philosophy" rather than "science," if that's what it takes to get your opponents to discuss the issue at all.

Of the various philosophical arguments around ID, some of my biggest concerns are with statements like G5, which is the close association - indeed, the near equation - of the word "design" with the idea that biological complexity could not evolve.

I can illustrate my concern most simply with this bag of watch parts. Actually, in the interest of truth-in-advertising, I should tell you that this isn't really a bag of watch parts, but a bag of little screws and wires and bits and pieces I picked up around the lab. But imagine please that I have disassembled a watch and put all the parts in this plastic bag. Now, I could shake this bag 24 hours a day for years and years, and the watch would never reassemble itself. But now imagine that I have another bag with the parts of a watch that is designed to self-assemble.

When I shake this bag, a little spring hooks onto a little screw and latches into place. The battery snaps into the battery holder and stays there. All the pieces of the watch are constructed so that, when two pieces that belong together collide with the right sort of trajectory, they hook together and stay hooked together. So if you shake this bag for an hour or so, in the end, you'll have an entire working watch - working, but with some tiny scratches here and there which indicate its history of being shaken together.

Now I present you with the ordinary watch, and with the watch which can self-assemble, and I ask this question: which watch is more cleverly designed? I know how most people would answer.

My point here is not to try to prove that God creating life-forms through evolution is somehow "better" than God creating life-forms through miracles. My point, rather, is that self-assembly is not the opposite of "design." Watches and biological life-forms can, in principle, be designed to self-assemble from simpler component pieces.

This brings up a potential conflict between the fine-tuning argument for ID and the biological complexity argument for ID. The laws of nature are finely tuned not only for the existence of atoms and stars and planets. The laws of nature are so finely tuned that atoms and stars and galaxies self-assemble out of the fundamental particles produced by the Big Bang. And after nucleosynthesis in first-generation stars, the laws of nature bring about the self-assembly of heavier elements like carbon and oxygen, and simple molecules, and planets with dry land, atmospheres, and water oceans. This self-assembly of all the physical forms of the universe is possible because of the fine-tuning of the laws of nature. I believe this is a powerful intuitive argument in favor of the fundamental laws of nature being designed.

But suppose the fine-tuning doesn't stop there. Suppose the laws of nature are fine-tuned not only for the self-assembly of molecules and stars and planets, but also for the self-assembly of biological life and biological complexity. If the laws of nature are so exquisitely fine-tuned that life and complexity can self-assemble, should that be considered evidence for design, or evidence against design? It seems to me that it should be considered as evidence for design. But that is not how it is presented by most advocates of ID. Most advocates of ID essentially argue that if biological life and biological complexity can self-organize, then that should be counted as evidence against design.

The way that ID is typically presented, by advocates of ID, is that there is a choice: either evolution is true, or things were intelligently designed. Evolution or design, one or the other. Now, I know that some advocates have made the point that this is a false choice. Some advocates of ID have made the following distinction: if biological complexity cannot evolve, then we have detected evidence of intelligent design action in biological history; however, if biological complexity can evolve, that neither proves nor disproves design, it merely means that we cannot unambiguously detect it.

That's a very good point, and I'm glad that some are making that point. However, that point is not being communicated to most audiences. Most audiences are hearing a very simple message: evolution or design; one or the other. Listen to church members and school boards and scientists. The message they have heard is, "evolution or design, one or the other." Philosophically, that is a flawed choice. Religiously, it is a dangerous message. And I urge everyone here, no matter where you stand on ID, to make the point that evolution-or-design is a false choice.

The reason I'm so passionate about that message is that there is, unavoidably, a religious dimension to ID. Now, I know that ID is sometimes presented as if it could be separated from religion. And I've already acknowledged that parts of Intelligent Design can be evaluated on their scientific and philosophical merits, apart from religious considerations.

However, everybody - and I do mean everybody - knows that ID has religious implications. And advocates of ID themselves frequently raise theological arguments when they are talking to Christian audiences.

While I haven't used any direct quotations, I have briefly paraphrased on your handout some of those theological arguments under point H. These arguments are worthy of being debated and discussed on their theological merits. Some of them, I would strongly oppose. Statement H5, on the other hand, I agree with. I particularly like statement H6. I happen to disagree with the H6. I do not think that good theology and hermeneutics make ID more likely to be true than evolutionary creation, and I'd love to have another 25 minutes to talk about why I think that H6 is false, and make a cumulative case in favor of evolutionary creation using scientific, philosophical, and theological arguments. But since I don't have the time for that, I will merely point out that I recommend H6 because I like the way it is phrased. Phrased this way, it could be the starting point for a spirited but friendly debate among Christian scholars.

(H1) Christians should embrace ID as a way to oppose atheism.

(H2) The "theistic" part of "theistic evolution" is essentially meaningless.

(H3) Theistic evolution is dangerous to the Christian faith.

(H4) God *definitely* used (scientifically detectable) supernatural events to create biological complexity.

(H5) It is reasonable to believe that God *might* have used (scientifically detectable) supernatural events to create first life and biological complexity.

(H6) Good theology and hermeneutics should lead us to conclude that ID is *more likely to be true* than theistic evolution.

Before I finish, I should point out that opponents of ID also make scientific and philosophical and religious arguments, and some of their arguments are strong, while other arguments are flawed. If I had another 25 minutes, I could give you examples of good and bad arguments for theistic evolution. But that isn't what I was asked to talk about.

So in conclusion: if Intelligent Design is partly scientific, partly philosophical, and partly religious, how can the debate over ID be conducted most productively?

To advocates of ID, I recommend the following:

Don't pretend that ID can be evaluated purely as science without consideration of religious implications. ID has religious implications, and everyone knows it. If someone asks you, "Who is the designer?" don't try to be coy and say, "I don't know" or "it doesn't matter." Instead answer, "That is a philosophical and religious question and I'll be happy to tell you my beliefs and the reasons for my beliefs; however, can we also discuss the scientific arguments on their scientific merits?" If someone tells you that ID isn't "scientific," reply by saying, "Yes, it's partly scientific and partly philosophical. But regardless of how you classify it, are the arguments themselves sound or unsound?" If you help your critics separate your scientific and philosophical arguments into categories with which they are comfortable, you can, I hope, avoid the unproductive demarcation argument and instead encourage your critics to confront and evaluate the strengths of your scientific, philosophical, and religious arguments, each in turn.

To opponents of ID, I recommend the following:

Don't play the demarcation game, that is, don't insist on definitions of science which try wholly to exclude Intelligent Design. Don't insist that ID must make specific empirical predictions in order to be "scientific." Understand that in science, it is OK sometimes to challenge the validity of one scientific model without immediately proposing an alternative model in detail. It can be scientifically valid and useful sometimes to argue that some particular event is unexplainable in terms of known natural laws. When advocates of ID are making such scientific arguments, don't try to trap them or shift the terms of the debate by asking,

"Who is the designer?" Instead: let's evaluate the scientific parts of ID on their scientific merits; let's evaluate the philosophical parts of ID on their philosophical merits; and let's evaluate the theological parts of ID on their theological merits.

**[Back to Top](#)**