Intelligent Design and Evolution Awareness Center

FAQ:
Why isn't intelligent design found published in peer-reviewed science journals?

The Short Answer:

Point A. Science is not done by committee. It does not matter that intelligent design is rarely found in the journals because as free-thinking responsible scientists, we must test a theory ourselves and see if it holds up and not judge a theory based upon its apparent lack of presence in mainstream journals, or even by the "popular opinion" of the scientific community.

Point B. ID proponents have published articles in peer reviewed science journals advocating their pro-design positions. Admittedly, these articles are rare. However, even if it does matter that intelligent design is scarcely found in mainstream peer reviewed journals, the counterpoint is that design is not excluded from the journals on the basis of its merits, but rather because of "new paradigm opposition." History of science has taught us that journals tend to exclude ideas which are radically opposed to current paradigms. Intelligent design is at odds with both the prevailing paradigm of biology today, evolution, as well as the prevailing mechanistic philosophy of science dominating origins science. Thus, exclusion of intelligent design is only to be expected, even if intelligent design is supported by evidence.

Point C. Though "opposition to new paradigms" plays a major role in the exclusion of design from journals, the exclusion is also the byproduct of a political controversy, which serves to instill misunderstandings about intelligent design theory in the minds of many scientists, who are misled to believe that intelligent design is an untestable religious theory that has no place competing with true empirically based scientific theories in the journals. Misunderstandings about the theory itself--and not opposition to its evidential merits--play a very large role in its exclusion.

Point D. Actually, upon closer inspection, once one understands the predictions of intelligent design theory, it becomes clear that there is much data published in the journals already supporting intelligent design theory; researchers simply have not been inferring design because the implications of their results have not been made clear to them.

The Long Answer:

A common objection to intelligent design theory is that intelligent design is not science, or at least it is "bad science" because papers advocating intelligent design are seldom, if ever, found in peer-reviewed mainstream scientific journals.

There is no doubt that there are a number of members of the intelligent design movement who have published quite extensively in mainstream journals. Two examples include intelligent design theorists Forrest Mims or William Dembski, both on the Executive Board for the International Society for Complexity, Information, and Design (ISCID) (ISCID is a professional research promoting scientific and philosophical scholarship and research into intelligent design theory). (In fact many creationists or proponents of intelligent design are well published in journals, as seen at Do Creationists Publish in Notable Refereed Journals? by David Buckna.) However, along the lines of this objection, these publications only count if they are actually advocating intelligent design theory, and are found in a mainstream scientific journal. It is quite correct to assert that there are very few papers explicitly advocating intelligent design theory in mainstream scientific journals.

There are various ways to address this objection. This response consists firstly of a brief outline, followed by a more detailed discussion of each point in the outline. This

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Expanded comments:

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Point A expanded:

This point requires little explanation. Suffice to say that science is not a democracy, and that the freedom of academic thought, and the right to dissent for evidential reasons is an important value that scientists hold. We must test a theory on its own merits by the predictions it makes and the data that is found, and not pronounce a verdict against a theory simply because supporting articles are apparently omitted from the scientific journals. In essence, if we are to think for ourselves, the fact that there are scant articles supporting intelligent design in mainstream scientific journals should make no difference.

This article will investigate the reasons for the exclusion further (Points B and C), and give a final discussion of the evidential merits of intelligent design (Point D).

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Point B expanded:
ID proponents have published in peer reviewed scientific journals. Many examples can be seen at http://www.discovery.org/a/2640

Thus, the argument that ID proponents do not participate in the scientific process or do not want to participate in the scientific process is simply false. They clearly do. Thus, the explanation for the scarcity of relevant articles by pro-ID authors in the journals must lie somewhere other than the lack of merits of ID or evil/improper motives/actions of ID proponents.

This point is actually affirmed by both leading Darwinists and ID proponents. In the volume *Debating Design*, co-editors Michael Ruse and William Dembski write the following:

> "To say that Intelligent Design is controversial is to offer a truism. It is opposed, often bitterly, by the scientific establishment. Journals such as *Science* and *Nature* would as soon publish an article using or favourable to Intelligent Design as they would an article favourable to phrenology or mesmerism – or, to use an analogy to the claims of the Mormons about Joseph Smith and the tablets of gold, or favourable to the scientific creationists' claims about the coexistence of humans and dinosaurs. Recently, indeed, the American Association for the Advancement of Science (the organization that publishes *Science*) has declared officially that in its opinion Intelligent Design is not so much bad science as no science at all and accordingly has no legitimate place in the science classrooms of the United States."

In the book, *The Beginnings of Western Science*, author David C. Lindberg notes that there are a variety of different definitions of science which seem to be at used times. One of these definitions is essentially "does it fit into the mainstream?:"

> "In many contexts science is defined not by its methodology or epistemological status, but by its content. Science is thus a particular set of beliefs about nature--more or less the current teachings of physics, chemistry, biology, geology, and the like."

Lindberg essentially notes that many define science by whether or not its content fits with the mainstream view, without regard for its methodology or actual evidence backing its claims. The question we must ask is, "Is the science that is commonly excluded from the journals excluded because it is *not good science* or because it goes it is simply out-of-step with the "current teachings?" Indeed, the famous philosopher and historian of science (as well as a physicist), Thomas Kuhn, in "The Structure of Scientific Revolutions," notes that what is considered science by one generation, may very well not be considered science by the next.

We must reflect upon history and ask ourselves, is it possible that intelligent design could be good science, and yet be excluded from the journals. To do this, let's explore Thomas Kuhn's theories about the way that scientific fields adopt new theories.

Kuhn's primary point in the book is how "scientific revolutions," or massive widespread changes in scientific thought, have taken place in various fields at various times during the history of science.

Essentially, Kuhn explains, scientists operate under a “paradigm,” which is an overarching theory that provides a framework for interpreting data, performing experiments, and doing further research. Paradigms are typically unquestioned, and reign over thinking in science much like the established law reigns over a system of courts.

In school, aspiring scientists are trained to think, research, and advance the paradigm. Today’s overarching paradigm governing biological origins research and thought is Darwinian evolution. Kuhn writes:

> "The study of paradigms, including many that are far more specialized than those named illustratively above, is what mainly prepares the student for membership in the particular scientific community with which he will later practice. Because he there joins men who learned the basis of their field forms the same concrete models, his subsequent practice will seldom evoke overt disagreement over fundamentals. Men whose research is based on shared paradigms are committed to the same rules and standards for scientific practice. That commitment and the apparent consensus it produces are prerequisites for normal science, i.e. for the genesis and continuation of a particular research tradition." (Kuhn, T., *The Structure of Scientific Revolutions*, 2nd Ed, 1970, Univ of Chicago Press, pgs. 10-11)

Kuhn notes that scientists schooled in the old paradigm become involved in “normal science” which is essentially puzzle-solving within the context of the old paradigm. “Normal scientists” spend most of their time solving specific problems by applying the old paradigm.

As an example of "normal science," under the paradigm of evolutionary biology, there is the claim that all organisms are related through common ancestry. Thus, thousands of pages of ink each year are spilled on journal articles comparing the DNA sequences of various organisms, and using algorithms to determine what they think is the best phylogeny, or ancestral history, of these organisms. This is the epitome of puzzle solving: using predictions of the paradigm to solve small-scale, but nonetheless important questions, such as, the phylogeny of reptiles or something of the like. However, Kuhn writes, normal scientists typically give little attention to the ideas behind new paradigms:

> "No part of the aim of normal science is to call forth new sorts of phenomena; indeed those that will not fit the box are often not seen at all. Nor do scientists normally aim to invent new theories, and they are often intolerant of those invented by others." (Kuhn, T., *The Structure of Scientific Revolutions*, 2nd Ed, 1970, Univ of Chicago Press, pg. 24)

One source that Kuhn cites is a paper by Bernard Barber in *Science* ("Resistance by Scientists to Scientific Discovery", Vol 134, pg. 596-602) where Barber concurs that science does tend to oppose new ideas.

Kuhn notes that when a scientific field commits to a paradigm, it invests much time, energy, resources, and even entire careers into that paradigm, saying, "[Operating within a paradigm] calls for the construction of elaborate equipment, the development of an esoteric vocabulary and skills, and a refinement of concepts that increasingly lessens their resemblance to their usual common-sense prototypes " (Kuhn, T., *The Structure of Scientific Revolutions*, 2nd Ed, 1970, Univ of Chicago Press, pg. 64).

In the real world, children are born, raised, and sent to college because of the support paradigm research provides to its adherents and practitioners. Kuhn notes that switching over to a new paradigm requires not only individual changes in scientific thought, but also a change in methods, equipment, and capital resources. Additionally, it should be noted that teaching methods and even the governing structure of scientific fields must be altered in response to a new paradigm. Furthermore, scientists trained in the “old paradigm” often have years of research, and perhaps their entire life’s work invested into investigating that paradigm. Scientific communities have essentially

countless dollars invested into upholding a particular paradigm. Journals committed to the paradigm represent millions of dollars spent performing thousands of experiments done by hundreds of researchers at dozens of institutions. These researchers have invested their entire lives and careers in advancing a given paradigm. Switching paradigms requires what Kuhn calls “retooling,” which requires great energy expenditure and is difficult. Kuhn writes that scientists of the old paradigm often have, "an immense restriction of the scientists' vision and a considerable resistance to paradigm change." (Kuhn, T., *The Structure of Scientific Revolutions*, 2nd Ed, 1970, Univ of Chicago Press, pg. 64)

In fact, Kuhn notes that evaluating different paradigms cannot be done by looking at how one paradigm (i.e. a set of journals) treats another paradigm:

> "Like the choice between competing political institutions, that between competing paradigms proves to be a choice between incompatible modes of community life. Because it has that character, the choice is not and cannot be determined merely by the evaluative procedures characteristic of normal science, for these depend in part upon a particular paradigm, and that paradigm is at issue. When paradigms enter, as they must, into a debate about paradigm choice, their role is necessarily circular. Each group uses its own paradigm to argue in that paradigm's defence." (Kuhn, T., *The Structure of Scientific Revolutions*, 2nd Ed, 1970, Univ of Chicago Press, pg. 94)

Switching paradigms doesn’t simply require these scientists to change their thinking, but to recommit the entire structure of the scientific community, and to call into question the life work of many researchers. This “retooling” is very costly, and also goes against a lifetime of thinking by many researchers. Needless to say, Kuhn finds that before new ideas take hold that challenge the old, but dominant paradigm, they are often met with great skepticism and opposition from members of the scientific community. Indeed Kuhn notes that when new paradigms are accepted, "their assimilation requires the elaboration of another set [of rules]. After they have become parts of science, the enterprise, at least of those specialists in whose particular field the novelties lie, is never quite the same again." (Kuhn, T., *The Structure of Scientific Revolutions*, 2nd Ed, 1970, Univ of Chicago Press, pg. 52).

Among scientists, skepticism of new ideas is perhaps not to be unexpected. Scientists are trained to be skeptical. However, they are often not trained to be skeptical about the old overarching paradigm. For many individual scientists, switching over to the new paradigm could jeopardize their very career--especially given the skepticism with which new ideas are met. Kuhn notes that paradigms tend to introduce rules and shared beliefs into the scientific community which guide normal science. Yet when a paradigm begins to weaken, rules are often constructed to define proper scientific methods which can "protect" the paradigm. Kuhn also notes that normal science opposes these new ideas. Debates often break out between people who doubt the current paradigm and want a new set of rules, and those who want to protect the current paradigm through a set of stringent rules.

Kuhn finds that the greatest allies of a new paradigm often include new scientists who have not yet committed their resources to the old paradigm. Other allies of the new paradigm include scientists who themselves were schooled in the old paradigm. These new paradigm proponents typically were troubled by quirks in the data which the old paradigm could not explain, and over time developed new methods of addressing the data. In time, their entire perspective on the field shifted. Kuhn finds that because retooling is so expensive, difficult, and scientists usually do not give up on the paradigm in which they were schooled easily, scientific revolutions often do not proceed through “conversions.” Rather, they occur through “replacement” where new scientists, attracted to the new paradigm, become open to its ideas, and old guards of the old paradigm, still unable to explain the quirks in their data, simply retire and naturally exit from the scientific community.

Until that replacement happens, however, skepticism and opposition persists. Scientific journals, typically are the home of “normal research,” often oppose new ideas that are hostile to the prevailing paradigm. Considering these new and counter-paradigm ideas might challenge the very foundation upon which the journal was built! Kuhn notes that new paradigms often start off as books, citing the examples of Aristotle's *Physica*, Ptolemy's *Almagest*, Newton's *The Principia*, Lavoiser's *Elements of Chemistry*, and Lyell's *Principles of Geology*. Kuhn could have cited Darwin's *Origin of Species*. Darwin did not publish his new ideas about evolution in a journal, where it would likely have been met with great skepticism and influence only the small sphere of scientists who read the journal. Rather, Darwin published a book, for all to read, and which could not be kept down by the guards of the old paradigm. Perhaps 30 years from now, Kuhn would add to the list Michael Behe's *Darwin's Black Box* and/or William Dembski's *The Design Inference*.

Switching to intelligent design theory, however, might not require simply a new perspective on looking at the data, but perhaps a new perspective in looking at science. As stated before, intelligent design theory is not a theory of the “supernatural,” and therefore intelligent design does not necessarily challenge philosophy of science in that regard. However, origins science typically excludes non-mechanistic causes from its grab-bag of explanations . Only mechanistic causes--the physical laws governing matter and energy--are seen as fair game for explaining events in natural history. Thus, the “retooling” required for science to accept intelligent design is twofold: 1) retool many biology research communities to research intelligent design and 2) retool science in general to search for non-mechanistic causes in natural history.

What many scientists don’t realize is that they have already admitted non-mechanistic causes into natural history. For example, many climatologists look at climate data and try to determine if rising levels of CO_2 are the result of human industry, or the natural result of cycles in the Earth’s orbital mechanics which affect climate. Intelligent causes are already allowed--we just have to expand their use into pre-recorded history as we learn more about how to detect intelligent design.

In conclusion, the point here is not that intelligent design theory is being discriminated against due to some sort of a vast evil conspiracy. Rather we have good reason to expect, from the history of science that even good, but novel scientific claims may be met with great skepticism and resistance from the scientific community. Two examples of these are Maxwell's equations and the Big Bang. Both of these experienced a fair amount of resistance prior to their acceptance. On two counts, thus, we may expect that novelty of intelligent design would provoke resistance: 1) intelligent design theory makes novel scientific claims, and 2) intelligent design theory employs a novel methodological approach to origins science. It is possible that intelligent design is resisted not because of some kind of lack of support for its claims but simply because of resistance to the novelties inherent within those claims.

Thus, in principle, the observation that “ID is not in the journals” could be evidence of something much different--and much more--than the empirical accuracy of the claims of intelligent design. It is also much more than simply the alleged claim that ID is not science. We could even be witnessing the start of a scientific revolution. There are anti-revolutionists who hope to see the revolution fail, and thus the revolution may not continue to full completion. However, regardless, the symptoms we see today are very much the same as what we would expect from a scientific revolution: a new paradigm is challenging an old one. If nothing else, this paradigm challenge seems to indicate that there could be more reasons keeping intelligent design out of the journals than the allegedly objective peer review process of science.

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Point C expanded:

Before reading further, we recommend that if you are interested in seeing the scientific underpinnings of intelligent design, that you read our article, "The Science Behind Intelligent Design to become familiar with the scientific basis for intelligent design.

To call intelligent design a supernatural theory of creationism, and then criticize it for not being found in the journals is to put intelligent design theory in a "catch-22" situation, where it cannot possibly win.

Creationism is often defined, in part, a belief in supernatural forces that are guiding the creation of biological structures, mechanisms, or organisms. Intelligent design was later directly labeled creationism,, claiming that it referred to the supernatural. Obviously, reference to supernatural causes is inappropriate for science. Thus, it may be deduced that one who associates intelligent design with creationism would not endorse a paper for intelligent design for acceptance into a mainstream scientific journal. But what happens if one then proceeds to criticize intelligent design for its lack of presence in mainstream scientific journals, as if this is some sort of an argument against its empirical support?

The answer is that whether realized or not, intelligent design has now been put in a "catch-22" situation, where the odds are stacked such that it is guaranteed to lose. This tactic is often employed by ID critics, and it goes something like this:

1. Intelligent design is not science because it refers to the supernatural. It should not be considered by scientists.
2. Intelligent design is bad science, or at least not-mainstream enough to be taken seriously, because it is rarely found in the scientific journals.

The obvious implication is that in making claim (1), the possibility of intelligent design ever being let into the journals is excluded. Yet, opponents of design still complain against the empirical legitimacy of intelligent design, making claim (2) because of its lack of presence in journals. A trap, in a sense, has been set for intelligent design.

To illustrate an example of this tactic used in the actual public political controversy, please allow me to give an account of a debate over the teaching of intelligent design theory from the Darwin Design and Democracy Conference III in the summer of 2002, in Kansas City, Missouri.

During the debate, four proponents of intelligent design squared off against four critics in an organized debate over whether or not design should be taught in schools. During the debate, Kansas Center for Science Education Director John Staver, an Darwinist, conceded that one could teach "scientific" criticisms of evolution and that this would be science, not religion. But Staver made his primary point clear: for intelligent design to be acceptable for a science classroom, it must first pass through the guardians of science into the mainstream scientific journals. Staver essentially was saying that if intelligent design becomes valid science (which supposedly occurs when it is accepted

into mainstream scientific journals), it is OK for the classroom. Yet, Staver said this only after claiming that intelligent design is a religious appeal to God which does not qualify as valid science. Only after labeling design as a mere religious appeal to the supernatural did Dr. Staver say, "Sure, we'll teach design once it makes its way into the journals."

As discussed above, intelligent design makes no references to the supernatural, and argues purely from mechanisms and data based off of observations of the natural world.

If intelligent design is simply false science, but science nonetheless, then we would expect to see sweeping refutations of irreducible complexity and detailed accounts of the evolutionary pathways of complex systems. To date, many attempts have been made, but in our opinion have generally failed (Dr. Ken Miller's "The Flagellum Unspun" is a good example--he claims the flagellum as an icon of ID has "fallen," yet provides no account for the origin of 2/3 of flagellum proteins, and a vague and undetailed reference to the previously mentioned impossible co-optation of the type III secretory system to account for the other 1/3. See Still Spinning Just Fine: A Response to Ken Miller by William Dembski).

We are therefore left with the former claim: intelligent design is excluded from journals because many scientists perceive it as nothing more than a blind appeal to the supernatural action of God, and is not science. Given that intelligent design does not refer to God nor the supernatural, but simply argues from our ability to describe and then detect the types of information remnant of prior action of intelligent agents, we must ask "why is intelligent design perceived by many scientists as some sort of a purely religious theory?" The answer to this question lies in the trickle-down theory of systemic misrepresentations of intelligent design.

The bottom line is that certain well-respected and widely-traveled scientists are intentionally spreading a false understanding of intelligent design, claiming that intelligent design 1) is merely a religiously motivated, religious appeal to the supernatural, 2) that it therefore lacks a testable mechanism and any potential empirical support, and 3) is therefore NOT science. Individuals promoting these misrepresentations speak at dozens of large-scale, often national-level gatherings of scientific communities and educators across the nation each year, spreading misinformation about intelligent design, and, based upon this false representation, convince many that intelligent design is not science.

There are other flavors of this misrepresentation--some say intelligent design is just a negative argument against evolution making a "God-of-the-gaps" argument, except leaving out the word "God" deceitfully, because design proponents are really arguing that God is the designer. Quotes from design proponents indicating their Christian faith or their belief in the God of the Bible as the Creator are then shown trying to prove that the design proponent really means God.

A simple reading of the works of design theorists such as William Dembski or Michael Behe show that they actually go to great pains in their writings to show how intelligent design has an empirical testable basis, and that its basis is empirical and in no way religious. For example, Dembski's *The Design Inference*, which lays out the methodology for detecting design, makes no reference to God, and only argues that we can detect design from our empirical everyday understanding of how intelligent agency works. Yet one of the most popular quotes among design critics is to quote Dembski saying something like, “The world is a mirror representing the divine life…Intelligent design readily embraces the sacramental nature of physical reality. Indeed, intelligent design is just the Logos theology of John's Gospel restated in the idiom of information theory.” (William Dembski, *Touchstone Magazine, A Journal of Mere Christianity*, July/August 1999, Vol 12, pg. 84). This quote

was written directed a Christian audience in a Christian journal in on design from a section entitled, "Design, Metaphysics, and Beyond." Dembski never argues that one ought to conclude that the God of the Bible is the designer from the evidence for design itself. He is merely discussing his philosophical interpretation of the meaning of design within Christian philosophy for the Christian audience to which he is writing.

The key is that Demski never argues that design scientifically implies the God of the Bible, nor does he ever use religious assumptions or premises for concluding design. Rather, when Dembski discusses his understanding of design for a Christian audience, he is free to make the statements like the above quote which pre-assume a Christian worldview.

Dembski addressed this issue in detail in a response to a questioner at his talk, "The Mathematical Proof of Complexity" (Hillsdale College, 11/13/02). He basically says the following: Dembski thinks intelligent design is three things: 1) a scientific program, 2) a cultural program for trying to understand the world apart from materialism and 3) a way to try to make sense theologically of divine action. Dembski says that he makes comments about the Christian theological interpretation of intelligent design because he is a Christian, and a philosopher, who is interested in category 3. However, he notes that when he discusses the actual science of design, such as in his secular books like *The Design Inference*, he argues for design only from its scientific foundations. But he notes that the science behind design stands on its own and be evaluated on its own, and we cannot dismiss the science of design simply because of Dembski's Christian beliefs or his interpretations of the theological meaning of design within a Christian context. Dembski notes that doing would also mean we would have to improperly dismiss the science advocated by Darwinists who are motivated in their study of evolution by their atheism. Dembski points out that he does not argue that Christ is the "completion of science" to a secular community, but rather discusses the relation of Christianity to intelligent design only for an already-Christian community, in the context of a long theological tradition of understanding Christianity and Science (a tradition which predates the creation - evolution controversy). Usage of these sorts of quotes does nothing to say that Dembski is publicly advocating that design implies the God of the Bible, or that design is a supernatural theory and not scientific. In fact, at the talk, Dembski made it explicitly clear that he does not even believe that we can scientifically detect identity of the designer. Dembski's arguments for design itself are strictly scientific.

Yet design critics continue to publicly assert that intelligent design is an untestable "God-of-the-gaps" religious appeal to the supernatural. These attractive misrepresentations of intelligent design theory are swallowed hook-line-and-sinker by their audiences, creating a false impression of intelligent design theory. This does well to create a widespread mistrust and misconception of intelligent design in the scientific community. This mistrust easily trickles down into the journal editors and paper reviewers, such that intelligent design, perceived as an untestable religious appeal to the supernatural (and not what it is: an empirical attempt to distinguish between the processes of design vs. the processes of natural evolution), has virtually no chance of being accepted into the scientific journals.

These tactics fit quite nicely with the proscriptions philosopher of science Phillip Quinn give to his Darwinist colleagues in how to combat creationism in the public square:

> Convinced of the overall rightness of ones position, one opts to present the effective bad argument. Each time one does this, one's hands get a little bit dirtier. At first one is painfully sensitive to even small compromises that one knows to be violations of one's intellectual integrity, but gradually numbness of conscience sets in. At last, when presenting the effective bad argument has become easy and habitual-second nature, as it were-one's hands have become

> dirty beyond all cleansing and one suffers from a thoroughgoing corruption of mind.
>
> [...]
>
> The application of what I have been saying to the creationist controversy is straightforward. It seems to me that the attempts by creationists to foist their particular brand of dreadful science on public school curricula are pernicious. We should resist such attempts and resist them effectively in the political realm. ... there may well be circumstances in which only the bad effective argument will work against them in the political or legal arenas. If there are, then I think, though I come to this conclusion reluctantly, it is morally permissible for us to use the bad effective argument, provided we continue to have qualms of conscience about getting our hands soiled. But I also believe we must be very careful not to allow ourselves to slide all the way down the slippery slope to intellectual corruption. Perhaps, if we divide up the labor so that no one among us has to resort to the bad effective argument too frequently, we can succeed in resisting effectively without paying too high a price in terms of moral corruption.
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> (Quinn P.L., "Creationism, Methodology, and Politics," in Ruse, M., ed., "But is it Science?: The Philosophical Question in the Creation/Evolution Controversy," Prometheus Books: Amherst NY, 1996, pp.397-399)

This "bad effective argument" tactic has spread incorrect ideas about intelligent design throughout scientific communities, and what has resulted is nothing less than a myth, widely believed among scientists, that intelligent design theory is simply an appeal to the supernatural to fill in some as-of-yet-unexplained gap in our knowledge. What many well-intentioned scientists (who may even end up one day peer reviewing a paper written by a design proponent) who have been misled to believe these things about intelligent design don't realize is that intelligent design is based off of a rigorous quantification and detection of the types of information produced by intelligent agency, and that it has a purely empirical and testable basis. They would know that if they took the time to read the works of Behe, Dembski, and others in great detail. But most scientists, like many people, get their information from the science media, and probably have neither the time nor the interest for an in-depth study of intelligent design. Many scientists get their information on this issue from groups like the prominent American Association for the Advancement of Science (AAAS), whose treatment of intelligent design will be discussed later.

When most scientists claim that "intelligent design is religion" they are not to be faulted, for they are merely regurgitating the latest they have read from some ID-misrepresentor, who they unwittingly perceive to be a trustworthy and honest source. Some, however, realize what they are doing when they making this claim.

And editors themselves are not without their own biases. The aforementioned Forrest Mims, an individual with an outstanding record of research and publication, was denied a job with Scientific American after editors discovered he rejected the overall story of Darwinian evolution and was sympathetic towards creationism. If people can be denied jobs because of a distaste for various ideas about origins, how much more can editors easily find an excuse to reject or censor portions of a paper that, in the editors' views, are not scio-politically correct.

However, intelligent design is also being excluded for another reason, perhaps less visible to the public eye, but at least equally important in the mind of the scientist. Biologist Rudolph Raff objects to design theory saying, "as the influence of the intelligent designer grows … the relationships between the phenomena and explanations becomes increasingly arbitrary … [until] one reaches a point where all biological features are 'special creations' and other explanations become unnecessary." (Raff,

Rudolf A., "The creationist abuse of evo-devo." Evol Dev, 3(6): 373-374 (2001)). In this case, Raff is not necessarily afraid that we are mixing science with religion, but that design is a sort of "science stopper." In fact, design theorist William Dembski sees Raff's arguments as typifying the reasons for the exclusion of design from science:

> "What has kept design outside the scientific mainstream these last 130 years is the absence of precise methods for distinguishing intelligently caused objects from unintelligently caused ones. For design to be a fruitful scientific theory, scientists have to be sure they can reliably determine whether something is designed. Johannes Kepler, for instance, thought the craters on the moon were intelligently designed by moon dwellers. We now know the craters were formed naturally. This fear of falsely attributing something to design only to have it overturned later has prevented design from entering science proper." (Dembski, W. A., "Introduction: Mere Creation", Mere Creation Science Faith & Intelligent Design, edited by William Dembski (InterVarsity Press, 1998) pg. 16)

It is fears like this that probably keep many scientists from considering design. A prime example of a general biological scientist whose perception of design would prevent him from ever considering design for acceptance into a scientific journal can be seen in the statements of Dr. Homer Montgomery in the syllabus for his "Age of Dinosaurs" class at UT Dallas:

> You will be penalized for citing anti-evolutionary material. It is not science. If the thesis of your paper is anti-evolutionary (akin to arguing against the germ theory of disease or against the atomic theory of matter) you will receive a failing grade. *Scientific journals do not publish papers with creationist and ID themes. I will certainly not accept them.*
>
> (Emphasis added. This was posted on the "Age of Dinosaurs Website" as of 1/12/03, from http://www.utdallas.edu/dept/sci_ed/Homer/dinosyllabus.html. The page has since been changed, but the comments indicate an inherent bias nonetheless)

As of 2/3/03, on this page, Montgomery cites Kenneth Miller, who, akin to the aforementioned misrepresentors, says the following about intelligent design:

> "A note below about a "new" creationism movement is in order. This quote is from Kenneth Miller who contributed to Life's Grand Design of the PBS series on Evolution.
>
> > 'ID states that living organisms must be the product of careful and conscious design, so perfectly formed that they cannot be explained by the random workings of evolution alone. Modern ID theorists contend that this is a new and novel scientific alternative to evolution. ID, however, has been rejected by the modern scientific community for the same reasons that it failed in the 19th century. When closely examined, the living world is filled with evidence that complex organisms not only could have evolved through evolution's trial-and-error mechanism, but must have done so, because their structure, their physiology, and even their genetic makeup are all inconsistent with the demands of intelligent design.' "

Here, Kenneth Miller seems to be implying that intelligent design = perfect design, and that there is no room for suboptimality. Miller, who has yet to successfully explain how the flagellum evolved, despite these claims, is clearly misrepresenting design as an appeal to perfection. Intelligent design is not making such brash claims, and indeed we hope that discussions here have shown that intelligent design means--intelligent design, and nothing more. However, this misconception has trickled down into the mind of Dr. Homer Montgomery, who now feels that intelligent design is not science, but rather some form of refuted 19th century philosophy, and cannot be accepted into scientific journals.

Dr. Montgomery states outright that intelligent design is creationism and is unfit for science. Were an intelligent design theorist to submit a paper to a journal, which then referred the paper to a reviewer such as Dr. Montgomery, then it is clear that Dr. Montgomery would recommend rejecting the paper *a priori*, simply because the paper advocates intelligent design. Dr. Montgomery feels intelligent design is not science, and therefore should be rejected. It is likely that Dr. Montgomery would see it as some

kind of a supernatural appeal to God without an empirical basis. In fact, as it turns out, this is exactly what happened when intelligent design proponent Dr. Michael Behe submitted a paper to an intelligent design journal. Behe is a biochemist at Lehigh University, and has published biology papers in mainstream journals unrelated to the evolution - design issue.

First, it should be noted that Behe has published at least one paper in a mainstream journal: Self-organization and irreducibly complex systems: A reply to Shanks and Joplin, *Philosophy of Science* 67, 155-162. However, Behe reports that, "while some science journal editors are individually tolerant and will entertain thoughts of publishing challenges to current views, when a group (such as the editorial board) gets together, orthodoxy prevails" (Correspondence w/ Science Journals Response to critics concerning peer-review by Michael Behe).

The opposition that Behe reports of from one journal editor almost perfectly exemplifies the exact sort of opposition that Kuhn says occurs when one challenges the prevailing paradigm:

> Dear Mike,
>
> I'm torn by your request to submit a (thoughtful) response to critics of your non-evolutionary theory for the origin of complexity. On the one hand I am painfully aware of the close-mindedness of the scientific community to non-orthodoxy, and I think it is counterproductive. But on the other hand we have fixed page limits for each month's issue, and there are many more good submissions than we can accept. So, your unorthodox theory would have to displace something that would be extending the current paradigm.

In a final letter back, the editor writes:

> I would like to encourage you to seek new evidence for your views, but of course, that evidence would likely fall outside of the scientific paradigm, or would basically be denials of conventional explanations. You are in for some tough sledding.

Essentially, this editor says that he cannot publish Behe's ideas because they are too "unorthodox" and would challenge the "current paradigm." A legitimate reason perhaps, from the vantage point of normal scientists. But in the end, this appears to be a textbook example of Kuhn's paradigm opposition at work--*and is NOT a good example of rejection for lack of empirical support or data.*

As another example of misconceptions about design keeping it from getting published, in "An Anonymous Review Of A Paper By Behe," Michael Behe submitted a paper to a scientific journal sometime before August 5, 2000. The paper was titled, 'Obstacles to gene duplication as an explanation for complex biochemical systems.' In the paper, Behe makes no references to God, and there is no evidence that Behe even mentions intelligent design as an actual cause. The paper is simply a discussion of what the title says it is, "Obstacles to gene duplication as an explanation for complex biochemical systems."

The reviewer appears to give a usual Darwinian explanation for how complex structures are built: through the co-optation of parts and gene duplication. Interestingly, the reviewer provides no elaboration of evidence to back up this scenario other than the bald assertion that it happened: "nature faced these difficulties and solved them." However, the bulk of the review actually does not discuss the topic of the paper, but rather focuses on critiquing intelligent design theory. In evaluating the review, Behe notes the following:

> "The manuscript did not argue for intelligent design, nor did it say that complex systems would never be explained within Darwinian theory."

As seen above, Behe took a conservative approach and argued for modest conclusions. He did not argue for intelligent design nor did he even say that Darwinian evolution was impossible. His paper merely suggests difficulties, or "obstacles," that would have to be overcome during the evolution of

complex systems. If such modest papers by intelligent design proponents get rejected, what hope does intelligent design have of ever being accepted by journals? Behe didn't even argue for intelligent design, yet the rejecting reviewer went as far as to say the following:

> "Consistently to use the phrase “intelligent design” instead of God is almost cheating, since this use has an ambiguous relation to the presence in the universe of a sort of intelligence that, except perhaps in a pantheistic sense if one wishes to think so, has no implication regarding the existence of a God. ...
>
> Of course science has its limits, but they are surely not where Behe places them; they are not, indeed, in the realm of biological evolution. The perception of science’s limits will evolve as science itself evolves, and the limits won’t furnish an argument in favor of intelligent design in the sense of a design imagines by a universal “person.” The argument will be in favor of the finiteness of the analytical powers of the human mind. The limits of science will probably be recognized as being, in part, imposed by the position in the universe of the intelligent (human) observer. Whatever God’s role in the universe, if any, biology will be understood without reference to him. That is implied by the essence of science."

However correct the reviewer may (or may not) be in his arguments, he refutes only a straw man. This argument rebuts nothing close to what Behe was arguing. The reviewer somehow felt that if he merely allowed a paper which suggests 'Obstacles to gene duplication as an explanation for complex biochemical systems' then somehow Michael Behe would then claim that a supernatural God created life. Thus, the true reasons for the reviewer's rejections become clear: the reviewer perceives challenges to evolution as evidence for intelligent design, and that intelligent design means a God did it. This reviewer clearly not only misrepresents what Behe argued for, but has a strong misconception about the workings and claims of intelligent design theory.

This exact scenario, which did occur, and is likely to happen again in the future, is exactly what is keeping intelligent design out of the journals. In fact, consider what happened when a journal editor did permit an article supporting intelligent design to be published:

In “The Branding of a Heretic,” (http://www.opinionjournal.com/taste/?id=110006220) Wall Street Journal commentator David Klinghoffer noted that the editor, Richard Sternberg, who permitted Stephen Meyer’s 2004 article to be published in the Proceedings of the Biological Society of Washington has essentially found his career thrown in the trash as a result:

> Whatever [Meyer’s] article's ultimate merits--beyond the judgment of a layman--it was indeed subject to peer review, the gold standard of academic science. Not that such review saved Mr. Sternberg from infamy. Soon after the article appeared, Hans Sues--the [Smithsonian] museum's No. 2 senior scientist--denounced it to colleagues and then sent a widely forwarded e-mail calling it "unscientific garbage."
>
> Meanwhile, the chairman of the Zoology Department, Jonathan Coddington, called Mr. Sternberg's supervisor. According to Mr. Sternberg's OSC complaint: "First, he asked whether Sternberg was a religious fundamentalist. She told him no. Coddington then asked if Sternberg was affiliated with or belonged to any religious organization. . . . He then asked where Sternberg stood politically; . . . he asked, 'Is he a right-winger? What is his political affiliation?' " The supervisor (who did not return my phone messages) recounted the conversation to Mr. Sternberg, who also quotes her observing: "There are Christians here, but they keep their heads down."
>
> […]

> In October, as the OSC complaint recounts, Mr. Coddington told Mr. Sternberg to give up his office and turn in his keys to the departmental floor, thus denying him access to the specimen collections he needs. Mr. Sternberg was also assigned to the close oversight of a curator with whom he had professional disagreements unrelated to evolution. "I'm going to be straightforward with you," said Mr. Coddington, according to the complaint. "Yes, you are being singled out." Neither Mr. Coddington nor Mr. Sues returned repeated phone messages asking for their version of events.
>
> Mr. Sternberg begged a friendly curator for alternative research space, and he still works at the museum. But many colleagues now ignore him when he greets them in the hall, and his office sits empty as "unclaimed space." Old colleagues at other institutions now refuse to work with him on publication projects, citing the Meyer episode. The Biological Society of Washington released a vaguely ecclesiastical statement regretting its association with the article. It did not address its arguments but denied its orthodoxy, citing a resolution of the American Association for the Advancement of Science that defined ID as, by its very nature, unscientific.
>
> It may or may not be, but surely the matter can be debated on scientific grounds, responded to with argument instead of invective and stigma. Note the circularity: Critics of ID have long argued that the theory was unscientific because it had not been put forward in a peer-reviewed scientific journal. Now that it has, they argue that it shouldn't have been because it's unscientific. They banish certain ideas from certain venues as if by holy writ, and brand heretics too. In any case, the heretic here is Mr. Meyer, a fellow at Seattle's Discovery Institute, not Mr. Sternberg, who isn't himself an advocate of Intelligent Design.

This circularity observation is very keen: ID is said to be unscientific because it isn't in the journals, but once it is in the journals it is said to be in appropriate because it is unscientific.

Even though intelligent design does have an empirical basis and ought to be at least taken seriously, it is dismissed outright because there is a general misconception among scientists that intelligent design equals a non-testable religious appeal God. Because of this misconception held by journal reviewers, they think intelligent design is inappropriate for science. There is a huge bias against intelligent design in the scientific community.

Some journal editors who might recognize that criticisms of evolution can at least be scientific still refuse to publish Behe's work. As Jonathan Wells reports:

> "When Behe submitted an essay to another biology journal, the editor wrote back:
>
> > 'As you no doubt know, our journal has supported and demonstrated a strong evolutionary position from the very beginning, and believes that evolutionary explanations of all structures and phenomena of life are possible and inevitable. Hence a position such as yours, which opposes this view on other than scientific grounds, cannot be appropriate for our pages.'"
>
> (Catch-23 by Jonathan Wells, from Research News & Opportunities, July 1, 2002)

To put it nicely, it seems clear that the mainstream journals themselves clearly have a perspective and viewpoint which can color article selection and tone. To put it not-so-nicely, one might say they have a bias and an unashamed agenda when it comes to the treatment of evolution and intelligent design. Wells further discusses how reviewers of some of his own published papers have required a "mandatory affirmation of faith in evolution."

Intelligent design theorist William Dembski makes similar points in *The Design Revolution*:

> Although peer review was a good thing for The Design Inference, I decided to forego peer review for its sequel, No Free Lunch. While I was still writing No Free Lunch, I contacted Cambridge University Press about publishing this book as a sequel to The Design Inference. Because The Design Inference had been Cambridge University Press's best selling philosophical monograph in several years, it seemed likely that they would be interested in a follow-up volume. I wanted a contract for this book on the basis of a prospectus and some sample chapters, not an uncommon request for a sequel to a highly successful monograph. I sought this so that I wouldn't have to wait almost two and a half years between the time I submitted the completed manuscript and its publication, as in the case of The Design Inference. My work was being widely discussed, and I wanted the sequel to appear without delay.
>
> The New York editor at Cambridge (not Brian Skyrms) informed me that even though The Design Inference was one of their bestsellers, it was controversial, and even though the press didn't mind controversy as such, it had come to light that I was being labeled a "creationist." Thus, before Cambridge University Press could issue a contract, I would have to submit the most controversial chapters of the new book. Besides this, I had inside information that even if No Free Lunch was accepted this side of the Atlantic, it was unlikely to be accepted with the Cambridge Syndicate in England, whose biologists were now disposed against my work. This news was actually quite surprising because the Cambridge Syndicate typically rubber stamps any recommendations for publication from the United States. That an exception was to be made in my case indicated that the review process, instead of working dispassionately and fairly, would be rigged to work against me. I therefore took my business elsewhere and published the book with Rowman and Littlefield.
>
> My own experience with the peer review process confirms an observation by Paul Gross: "Being right isn't enough. What you say, however right, must be said in a currently acceptable language, must not violate too brutally current taste, and must somehow signal your membership in a respectable professional club." (www.mbl.edu/publications/Gross/Heilbrunn) I was an unknown entity when I published The Design Inference, and the book didn't address the implications of the design inference for biology. Once those implications became clear, however, getting my work published in the peer-reviewed literature became more challenging -- though certainly not impossible. I have, for instance, another book coming out with Cambridge University Press titled Debating Design co-edited with Michael Ruse. Six out of seven referees approved it enthusiastically and the lone dissenter grudgingly admitted that it would sell very well.

Yet misconceptions or unsurprising biases alone are not always what keep intelligent design out of the journals. Sometimes, the problem is from utter disdain of intelligent design by the journals themselves. Though Behe found that some journal editors are open minded, some journals have clearly taken a stand against intelligent design theory. Both the two most eminent journals--*Nature* and *Science* appear to have taken such a stance. Though far less outright, we shall first discuss *Nature*:

The May 8, 2003 issue of *Nature* contains a letter to the editor from Dr. U. Kutschera of the Department of Biology, University of Kassel, Germany. While the fact that the letter criticizes intelligent design doesn't necessarily imply that the journal is biased, for this letter merely reflects the opinion of one of its readers, one has to look at the content of the letter, and the letter that was excluded to peer behind and see the workings of journal letter selection. First, the letter employs at least 1/2 of the aforementioned catch-22 fallacy:

> The ID strategy is not to identify the 'designer' as God in the Bible or for adherents to call themselves creationists; they have coined the term 'theists' to describe themselves (see ref. 2 for

> a discussion). Last year, ID-creationism took a step towards scientific respectability when Lönnig and Heinz Saedler [two intelligent design proponents] published an [sic] review [3] entitled "Chromosome rearrangements and transposable elements".
> ...
> Four years ago, this journal published two excellent editorials [6, 7] entitled "The difference between science and dogma" and "Combating the exploiters of creationism". I think that the time is ripe to continue this series.

This letter explicitly acknowledges mainstream publications that might support intelligent design, and then proposes to make clear the difference between "science and dogma" which seems to be an implicit call to warn people of the supposed anti-scientific nature of intelligent design, and a scolding of the journal that publishes such "dogma." Whether this is played out in *Nature* will have to remain to be seen, however this seems a clear call to dissuade journals from giving intelligent design respectability and to not publish works authored by intelligent design proponents. In fact, that is exactly what *Nature* did the issue it published *this* letter.

On May 1, 2003, in the previous week's issue, *Nature* published an article by Hirotsune et. al. discussing the discovery of a functional pseudogene (*Nature* 423:91-96, 2003). Supposedly-functionless pseudogenes are often cited as evidence against design and in favor of evolution. Soon after the article by Hirotsune et. al., design proponent Michael Behe submitted an open letter to *Nature* noting that scientists should be wary of using negative "lack-of-function" arguments because, "[t]he contention that unintelligent processes can account for complex biological functions should, to the extent possible, be supported by positive results, rather than by intuitions of what no designer would do." Yet, concurrent with publishing a letter scolding those who publish works from design-proponents and implying that scientists must learn why they shouldn't publish such things, *Nature* replied to Behe that they could not publish his own letter because of a "lack of space" (see A Functional Pseudogene?: An Open Letter to Nature by Michael Behe). It is noted that *Nature*, "found space in the next issue to publish a 468 word letter warning of the dangers of intelligent design in Germany" though Behe's letter was only 350 words.

This seems to be a clear case of journals choosing which of two letters to publish: 1) a letter from a Darwinist implying scientists and journals should not publish works from ID-proponents, or 2) a letter from an ID-proponent discussing how an argument against design and for evolution is strongly challenged by recent research article published in that very journal. *Nature* chose to publish the former, indicating their position on the matter. Perhaps Nature has taken Dr. Kutschera's advice. Nature can be commended for one thing, however. On May, they published an article, The Evolutionary Origin of Complex Features, co-authored by vocal public ID-critic Robert Pennock. The article used a computer program to attempt to show how complexity could evolve. While the program's fails to imitate the real world short because of some pre-programmed specifications and the fact that it guarantees survival at low fitness levels, its problems will hopefully be expounded by a reply from proponents of intelligent design. If such a reply is made, hopefully *Nature* will publish it. Regardless, this paper seems to inadvertently give intelligent design some level of credibility: it

While *Nature* seems to criticize intelligent design through subtle letters and research articles, the eminent journal *Science* has made outright attacks through ridicule.

It first needs to be noted that *Science* and *Nature* are generally held to be the world's prestigious and leading scientific journals. In a mocking attack on upon intelligent design, the journal *Science* (*Science* 297:1991, September 20, 2002) stated:

> "In the past few years, the chief think tank for 'intelligent design'--the thinking man's creationism--has transformed its public image. The Center for the Renewal of Science and Culture, part of the

> Seattle-based Discovery Institute used to have Michelangelo's God creating Adam as its logo ... last month, "renewal" was eliminated from the center's name ... But [the anti-creationist political activist group the "National Center for Science Education" (NCSE)] NCSE says, "There is still a superfluous word in the center's name: 'Science.'"

The last phrase, though a quote from the obviously-skeptical NCSE, is nothing less than an endorsement of a joke made at the expense of intelligent design theory, claiming that intelligent design is not science. Another interesting incident happened in 2002 when Science referred to ID-proponents and other skeptics of evolution as the "forces of darkness:"

> Eugenie Scott, a tireless battler against the forces of darkness on the evolution front, has been chosen for this year's Public Service Award by the National Science Board. ("Evolution Champion," Science, March 15th 2002 Vol 295:2009 (in "Random Samples" section).)

These may seem like a petty incidents, but the journal Science is not just any journal--it is probably one of the two leading scientific journals in the world, at least second to, if not tied in prestige with the journal Nature. Thus, other journals, and the American and international scientific community as a whole, take many of their cues from what is issued by the top journals, such as *Science*, particularly with regards to how they treat issues such as intelligent design theory. If *Science* makes intelligent design theory the butt of jokes, what chance does the theory have of being taken seriously by editors or reviewers of any journal?

But *Science* has gone much further than making a little joke. The American Association for the Advancement of Science (AAAS), the publisher of the journal *Science* apparently perceives intelligent design as some kind of a threat to science itself. In a press release issued against intelligent design theory late in 2002, it said, in part:

> "The movement presents "intelligent design theory" to the public as a theoretical innovation, supported by scientific evidence, that offers a more adequate explanation for the origin of the diversity of living organisms than the current scientifically accepted theory of evolution. In response to this effort, individual scientists and philosophers of science have provided substantive critiques of "intelligent design," demonstrating significant conceptual flaws in its formulation, a lack of credible scientific evidence, and misrepresentations of scientific facts."
>
> "Recognizing that the "intelligent design theory" represents a challenge to the quality of science education, the Board of Directors of the AAAS unanimously adopts the following resolution:"
>
> "Whereas, ID proponents claim that contemporary evolutionary theory is incapable of explaining the origin of the diversity of living organisms;"
>
> "Whereas, to date, the ID movement has failed to offer credible scientific evidence to support their claim that ID undermines the current scientifically accepted theory of evolution;"
>
> "Whereas, the ID movement has not proposed a scientific means of testing its claims;"
>
> "Therefore Be It Resolved, that the lack of scientific warrant for so-called "intelligent design theory" makes it improper to include as a part of science education;"
>
> "Therefore Be Further It Resolved, that AAAS urges citizens across the nation to oppose the establishment of policies that would permit the teaching of "intelligent design theory" as a part of the science curricula of the public schools;"

"Therefore Be It Further Resolved, that AAAS calls upon its members to assist those engaged in overseeing science education policy to understand the nature of science, the content of contemporary evolutionary theory and the inappropriateness of "intelligent design theory" as subject matter for science education;"

"Therefore Be Further It Resolved, that AAAS encourages its affiliated societies to endorse this resolution and to communicate their support to appropriate parties at the federal, state and local levels of the government."

In this press release, the preeminent scientific organization in America and one of the foremost scientific groups in the world has publicly taken a stand against intelligent design theory, declaring it to be without empirical support, without a testable mechanism, and deserving of opposition wherever it is taught. What journal editor would dare go against proclamations such as this? Evolution is declared the winner, intelligent design the loser. Yet, as Galileo said, the earth still turns.

As noted earlier, even prominent Darwinist Michael Ruse and ID-proponent William Dembski recognize that this sort of behavior indicates a bias in journals:

> "Journals such as *Science* and *Nature* would as soon publish an article using or favourable to Intelligent Design as they would an article favourable to phrenology or mesmerism – or, to use an analogy to the claims of the Mormons about Joseph Smith and the tablets of gold, or favourable to the scientific creationists' claims about the coexistence of humans and dinosaurs. Recently, indeed, the American Association for the Advancement of Science (the organization that publishes *Science*) has declared officially that in its opinion Intelligent Design is not so much bad science as no science at all and accordingly has no legitimate place in the science classrooms of the United States."
> (Michael Ruse and William Dembski in General Introduction to *Debating Design*, pg. 3-4 (Cambridge University Press, 2004))

It should be noted that there are no references to the refutations in this press release, nor is there a detailed quotation of intelligent design proponents. Is the AAAS such a bold authority that it essentially cite itself, dismissing intelligent design theory in one single press release without any references to any of the alleged refutations?

Though this press release and the aforementioned mocking appeared in issues from late, 2002, *Science* has a history of allowing a certain brand of information about intelligent design theory to be promoted throughout the scientific community. In May of 2000, Eugenie Scott, Director of the National Center for Science Education, was given a two page opinion article in *Science*'s prestigious "Essays on Science and Society" column, entitled "Not (Just) in Kansas Anymore." Scott then introduced the world to what she called "intelligent design creationism" ("IDC"). IDC, she wrote:

- "advocates the idea that evolution (and modern science in general) are stalking horses for philosophical materialism and atheism."
- "claim[s] that if evolution is true, there is a substantial price to pay in loss of purpose and meaning of life."
- argues for "theistic science" and, "when it comes to the scientific issues, [] are vague--and very much disunited."

Scott represented intelligent design as a theistic movement, and did not stress its empirical basis nor the attempts to make it into a serious research program. She instead stated that,

> "Behe argues that natural selection is incapable of explaining certain kinds of complex molecular structures that supposedly would not function without a minimal number of interacting components; hence, we must seek an "intelligent" (divine) explanation."

Interestingly, this is exactly why the senior anonymous reviewer of Behe's article dismissed Behe's argument--because he perceived it as an argument from ignorance leading to a mere religious appeal to the supernatural. Perhaps this reaction is the easiest and most "effective" way to dismiss the arguments without taking them seriously in their empirically-based claims. But, in the end, it is does not accurately represent the claims of intelligent design theory. Phillip Quinn would probably be proud.

Scott dismisses irreducible complexity and the methodology for the design inference, but perhaps it wasn't her job to discuss those issues in her essay. What she concludes with, however, is more interesting:

> "Although IDC proponents seek validation by university colleagues and intellectuals, they have not yet produced scholarship accepted in scientific circles."

First, Dr. Scott's claim is fatally challenged by William Dembski's *The Design Inference*, which was published through the Cambridge University Press philosophical monograph series, and turned out to be one of their best selling titles in recent years. Since the writing of Scott's essay, Dembski's book has been cited (favorably) in the mainstream literature at least 3 times:

• W.-E. Loennig & H. Saedler, “Chromosome Rearrangements and Transposable Elements,” *Annual Review of Genetics*, 36 (2002): 389–410.

> This article examines the role of transposons in the abrupt origin of new species and the possibility of an partly predetermined generation of biodiversity and new species. The authors’ approach in non-Darwinian, and they cite favorably on the work of Michael Behe and William Dembski.

• D.K.Y. Chiu & T.H. Lui, “Integrated Use of Multiple Interdependent Patterns for Biomolecular Sequence Analysis,” *International Journal of Fuzzy Systems*, 4(3) (September 2002): 766–775.

> The opening paragraph of this article reads: “Detection of complex specified information is introduced to infer unknown underlying causes for observed patterns [10]. By complex information, it refers to information obtained from observed pattern or patterns that are highly improbable by random chance alone. We evaluate here the complex pattern corresponding to multiple observations of statistical interdependency such that they all deviate significantly from the prior or null hypothesis [8]. Such multiple interdependent patterns when consistently observed can be a powerful indication of common underlying causes. That is, detection of significant multiple interdependent patterns in a consistent way can lead to the discovery of possible new or hidden knowledge.” Reference number [10] here is to William Dembski’s The Design Inference.

• *Life Evolving: Molecules, Mind, and Meaning*, By Christian de Duve (Oxford University Press, 2002 pp. 52-53) (de Duve doesn't conclude design, but cites to Dembski favorably):

> To explain the generation of the ancestral proteins -- the fact that this process took place by way of nucleic acids makes no difference to the argument -- by the natural unfolding of chemical processes, one would have to assume either that almost any random combination of amino acids will produce a collection of proteins adequate to make a viable cell or that the molecular specificity of the processes involved was such as to almost obligatorily produce the right mixture. The first explanation is ruled out by what we know of biology, which tells us that the functions of proteins often are exquisitely dependent on specific sequences, to the point of being frequently impaired by the replacement of a single amino acid by another. The second explanation is ruled out by what we know of chemistry. Processes of the required precision simply do not take place. Hence, it is claimed, there must have been something else. Such is the

conclusion arrived at in a solidly argued book by the American mathematician William Dembski significantly titled *The Design Inference*.

These citations were reported by William Dembski. In fact, in *The Design Revolution*, design theorist William Dembski says the following on this point:

If intelligent design is a scientific research program, why don't design theorists publish or have their work cited in the peer-reviewed literature?

The claim that design theorists do not publish or have their work cited in the peer-reviewed literature is false. In fact, it is false any way one interprets that claim. The International Society for Complexity, Information, and Design (www.iscid.org) has emerged as the professional society of the intelligent design community. That society, at the time of this writing, lists over fifty research fellows. The fellows of the society include full-fledged senior faculty at such schools as Oxford University in England, Princeton University in the United States, University of New Brunswick in Canada, University of Sydney in Australia, University of Auckland in New Zealand, Hanyang University in Korea, Helsinki University of Technology in Finland, and the State University of Applied Sciences in Frankfurt Germany (see www.iscid.org/fellows.php).

The ISCID fellows cover the gamut of disciplines, including the full range of natural sciences. All the fellows are distinguished researchers in their own right and have published extensively in the peer-reviewed literature in their respective disciplines. Fritz Schaefer, the inventor of computational quantum chemistry, stands out. With over 900 peer-reviewed publications, he is the third most cited chemist in the world and has been considered for the Nobel Prize five times. Hence there is no question that design theorists publish and have their work cited in the peer-reviewed literature -- they are credible scientists and scholars.

Of course, the real question is whether design theorists publish work that supports intelligent design in the peer-reviewed literature. Here again there is no problem. Readers may refer to the ISCID bibliography at www.iscid.org/bibliography/bibliography.php for works in the peer-reviewed literature by design theorists that support intelligent design (note that this is a bibliography of design-relevant literature and thus also includes references to work by scientists who are not design theorists). Rather than list a number of such works, it may be instructive for me here to describe the peer review process for my book The Design Inference because it points up intelligent design's progress in breaking into the peer-reviewed literature as well as the obstacles we face.

The Design Inference appeared in Cambridge University Press's monograph series Cambridge Studies in Probability, Induction, and Decision Theory. This series is the equivalent of a journal. It has a general editor, Brian Skyrms (who is a member of the National Academy of Sciences). It also has an editorial board, which at the time of publication consisted of the following: Ernest Adams, Ken Binmore, Jeremy Butterfield, Persi Diaconis, William Harper, John Harsanyi (who in 1994 shared the Nobel Prize in economics with John Nash, the protagonist of A Beautiful Mind), Richard Jeffrey, Wolfgang Spohn, Patrick Suppes, Amos Tversky, and Sandy Zabell. This editorial board constitutes a literal who's who in the statistics and inductive reasoning world.

The Design Inference went to three anonymous referees for a grueling year-long review process. The first referee was overwhelmingly positive. The second referee was on balance negative, though s/he had some positive things to say about the manuscript. The general editor wanted the book in his series and therefore gave it to a third referee as a tie breaker. The third referee was very positive about the manuscript but wanted significant revisions (the referee report was seven

> single-spaced pages). I agreed to do the revisions, whereupon the book was recommended to the Cambridge Syndicate, which in turn then issued me a contract to publish the monograph. The review/referee process for The Design Inference was more rigorous than anything I've experienced in the peer-reviewed journals in which I've published, and that includes math, philosophy, and theology journals. The only reason The Design Inference didn't appear in a journal is that the argument required a book-length treatment. This book has been widely cited, and that includes the peer-reviewed scientific literature (e.g., The International Journal of Fuzzy Systems).

However, even if it were true that ID-scholarship is not accepted in scientific circles, note how she first disguises intelligent design as "creationism," "theistic science," and an argument for "divine explanation" and then criticizes it for a lack of acceptance in scientific circles. This is a clear implementation of the "Catch-22" tactic. Scientists who don't know any better, and have not read Behe or Dembski, believe what they are told by the authorities and are led to falsely believe that ID scholarship is shoddy, and simply a religiously based untestable argument.

It is articles such as this, from mainstream scientific journals, that begin the "trickle-down" effect to disseminate misinformation about intelligent design to the scientific community that intelligent design is not science. The battle no longer comes down to an honest and fair treatment of the claims, but to fighting a public relations war using Phillip Quinn's proscriptions, which appear to be working quite effectively.

But, after reading point A, we have learned that when scientists challenge the prevailing orthodox paradigm, they tend to face strong opposition. Famed historian of science Thomas Kuhn recognizes and emphasizes this point. In fact, this point was conceded by the aforementioned editor of the journal to which Behe submitted his paper questioning evolution, despite the editor's feelings that the paper could ultimately have promise. The above accounts hopefully demonstrate that intelligent design is indeed facing nothing less than undue opposition from the scientific community to its claims. It is not being kept out of journals because it lacks empirical value or is scientifically inaccurate. Instead, it is being misrepresented, misunderstood, mocked, publicly decried, and in other arenas, even legislated against.

Intelligent design is NOT excluded from journals because it is lacking a testable mechanism, empirical support, or because it tries to wrongly breach the boundaries of scientific investigation. It is not found in the journals because it challenges a prevailing orthodox paradigm, and powers that be are waging a public relations war. This PR is fought by misrepresenting ID's claims (ala Quinn) to the scientific community such that journal editors, paper reviewers, and scientists at large are led to believe it is a religious appeal to God lacking any empirical support, or they simply exclude it because it controverts the prevailing paradigm.

Yet, as the data pours in and intelligent design theorists continue to refine their arguments, the actual scientific aspect of this issue appears to hold promise for intelligent design, at least for those that would listen.

Point D. Actually, upon closer inspection, once one understands the predictions of intelligent design theory, it becomes clear that there is much data published in the journals already supporting intelligent design theory; researchers simply have not been inferring design because the implications of their results have not been made clear to them.

Point D Expanded:

Once we legitimize “the design inference,” what remains to be done is to apply the processes by which we infer design to the data and see what is found. Much research which supports the design inference is currently being done, even by individuals who are not pro-intelligent design. The evidence which supports intelligent design is already to be found in the journals. The problem is that the journals typically will not recognize that the evidence they have supports intelligent design, for reasons mentioned in points A and B. However, in discussing intelligent design, we must ask if the predicted data is found, whether it is found by an intelligent design proponent, or not.

Like any good scientific theory, intelligent design can make predictions. From our observations about intelligent design, we can understand that intelligent designers can:

(1) Take many parts and arrange them in specified complex patterns which perform a specific function.
(2) Rapidly infuse any amounts of genetic information into the biosphere, including large amounts, such that at times rapid morphological or genetic changes could occur in populations.
(3) 'Re-use parts' over-and-over in different types of organisms (design upon a common blueprint).
(4) Be said to typically NOT create completely functionless objects or parts (although we may sometimes think something is functionless, but not realize its true function).

We can then use this understanding of the mechanism of intelligent design to make a few predictions:

(1) High information content machine-like irreducible complex structures which exhibit specified complexity will be found.
(2) Fossil forms will be found that appear suddenly and without any precursors.
(3) Similar genes and functional biological parts will be found (re-used by the designer) in different and unrelated organisms.
(4) There will not be much useless "junk" in biology, such as vestigial organs or alleged functionless DNA.

All of these predictions are testable. Experiments for intelligent design are being performed, although (perhaps because of a lack of funding due to misconceptions on the part of the scientific community about design) they are coming forth slowly. However, the mere fact that such experiments could theoretically be performed should suffice to support the point here. While intelligent design proponents may not necessarily (but sometimes may) be the ones actually going out and performing the experiments or obtaining the data to support these predictions, experiments which support intelligent design have been performed.

It should be noted that these predictions do not have to be met in ALL cases for intelligent design to be inferred. Indeed, intelligent design is one possible explanation, evolution is another. Sometimes design might be the appropriate explanation, at other times, evolution. Intelligent design intends for itself to be a viable possible explanation which scientists can use, along with other explanations, to explain how life got here. Testing predictions of intelligent design vs. predictions of evolution could be a useful exercise for scientists who want to investigate these subjects. However, there are many cases where intelligent design predictions are clearly met.

Each of these above four predictions will be looked at extremely briefly to see if the prediction been met based upon reviewing the research journals.

(1) Searching for specified complexity.

One hot area of research relevant to testing design is investigating protein specificity. Many new articles have been published in recent years, and many new research groups are beginning to ask questions about how specific biological parts must be in order to function. Five such articles include:

• "Exploring the Conformational Properties of the Sequence Space between two proteins with different folds: An Experimental Study" by F. Blanco, I. Angrand, and L. Serrano in *Journal of Molecular Biology* (1999) 285:741-753

• "Estimating the Entropy of DNA Sequences" by A. Schmitt and H. Herzel in *Journal Theoretical Biology* (1997) 1888:369-377.

• D.D. Axe, “Extreme Functional Sensitivity to Conservative Amino Acid Changes on Enzyme Exteriors,” Journal of Molecular Biology, 301 (2000): 585–595.

• M.J. Denton & J.C. Marshall, “The Laws of Form Revisited,” Nature, 410 (22 March 2001): 417.

• M.J. Denton, J.C. Marshall & M. Legge, (2002) “The Protein Folds as Platonic Forms: New Support for the pre-Darwinian Conception of Evolution by Natural Law,” Journal of Theoretical Biology 219 (2002): 325–342.

(2) Looking for large infusions of genetic information into the biosphere.

A perfect example of this can be found in the Cambrian Explosion of the fossil record. We have a host of quotes on this subject at our **Error! Hyperlink reference not valid.**. This is a detailed subject, but to quickly provide a quote which supports the above claim, consider the following quotes from evolutionist paleontologist Robert Carroll and evolutionary zoologist Richard Dawkins:

"In all major lineages, the earliest known members had already achieved the basic body plan of their living descendants. They differed in details, but most can be readily allied with their modern descendants . . . . Few fossils are yet known of plausible intermediates between the invertebrate phyla, and there is no evidence for the gradual evolution of the major features by which the individual phyla or classes are characterized." (Robert Carroll, Patterns and Processes of Vertebrate Evolution, Cambridge: Cambridge University Press, 1997, pp. 4)

“For example the Cambrian strata of rocks, vintage about 600 million years, are the oldest ones in which we find most of the major invertebrate groups. And we find many of them already in an advanced state of evolution, the very first time they appear. It is as though they were just planted there, without any evolutionary history. Needless to say, this appearance of sudden planting has delighted creationists. Evolutionists of all stripes believe, however, that this really does represent a very large gap in the fossil record, a gap that is simply due to the fact that, for some reason, very few fossils have lasted from periods before about 600 million years ago. One good reason might be that many of these animals had only soft parts to their bodies: no shells or bones to fossilize. If you are a creationist you may think that this is special pleading. My point here is that, when we are talking about gaps of this magnitude, there is no difference whatever in the interpretations of `punctuationists' and `gradualists'. Both schools of thought despise so-called scientific creationists equally, and both agree that the major gaps are real, that they are true imperfections in the fossil record. Both schools of thought agree that the only alternative explanation of the sudden appearance of so many complex animal types in the Cambrian era is divine creation, and both would reject this alternative." (Richard Dawkins, The Blind Watchmaker, 1986, pp. 229-230)

***Dawkins does not mention the possibility of intelligent design (this was written in 1986, before many design proponents began writing), which allows for intelligent action but does not require supernatural intervention.

Although there are other similar examples, the Cambrian Explosion represents exactly what one would expect from massive intelligent design, and not what is expected from evolutionary processes.

(3). Similar genes and functional biological parts will be found (re-used by the designer) in different and unrelated organisms.

This prediction is met in various phylogenies where extreme “convergent evolution” is found. A few examples include proteins such as relaxin, insulins, adrenocorticotropic hormone, somatostatin, histocompatability antigens, neural glycoproteins and microglobulin are distributed in both animal and non-animal groups in ways which differ markedly from predictions of common descent (Schwabe, C., Warr, G. W., "A polyphyletic View of Evolution: The Genetic Potential Hypothesis." Perspectives in Biology and Medicine, 27, 3, Spring 1984 pg. 465-484. See also "On the validity of molecular evolution" by Christian Schwabe (TIBS 11 - July 1986 pg. 280-283)).

(4). More function, less non-function.

A classic example of this can be found in “junk-DNA.” Many evolutionists see “junk-DNA” as an evolutionary relic of ancient discarded genes. Not only do they claim it is a fulfilled prediction of evolution, but it is seen as a non-functional product that an intelligent designer wouldn’t create. Yet, in recent years, more and more types of “junk-DNA’ have been found to have function. If this trend continues, perhaps eventually most DNA will be found to have function (though probably not all as some information loss has undoubtedly occurred whether it was originally designed or not). Consider the following examples:

The NY Times reported that "huge stretches of DNA that do not contain protein-coding genes and have been considered "junk" actually hold the code for some of this RNA" which apparently plays a large role in gene regulation. (RNA Trades Bit Part for Starring Role in the Cell, 1/20/03).

With the recent sequencing of the mouse genome, the Washington Post reported that 3% of non-gene portions of the human and mouse genomes seem to be highly "conserved" or similar, implying functionality. These similarities come from portions of the genome which do NOT code for genes, and were previously thought to be functionless "junk-DNA". The article speculated these portions may regulate growth or gene expression and quoted one of the leading scientists who sequenced the mouse genome saying, "*My goodness, there's a lot more that matters in the human genome than we had realized*." A report was published in *Nature* 420, 520 - 562 (2002).

Another study, "Large-scale comparison of intron positions among animal, plant, and fungal genes" (Proc. Natl. Acad. Sci. USA, Vol. 99:16128-16133, 12/10/02), found similarity in introns among distantly related organisms. This blow to "junk DNA" comes from Harvard microbiologists who found that as much as 20% of introns in plants, animals, and fungi are found at similar chromosomal loci. Under the evolutionary interpretation, this implies these introns have persisted in similar locations for many hundreds of millions of years in the ancestors, which is extremely unlikely to have occurred if these non-coding introns truly are purely functionless and randomly-inserted pieces of so-called junk-DNA.

Essential Cell Division "Zipper" Anchors to So-Called Junk DNA: Mechanism May Provide Insights Into Development and Cancer. Previously thought “genetic junk,” ALU sequences appear to have some functionality providing anchoring points for chromosomes to link to one-another during mitosis (cell duplication). See *Nature* Vol 418:994-998 for details.

Study suggests that "Junk DNA" may have a purpose. Transposable L1 elements, typically thought to be non-coding "junk DNA," comprise 17% of our DNA and seem to have a newfound purpose, as they have the ability to repair DNA breaks in chromosomes. Other recent studies have suggested that noncoding "Junk DNA" may play roles in regulating gene expression (see http://www.psrast.org/junkdna.htm for references) or that noncoding DNA could actually provide necessary structural material to physically maintain a larger size for a cell (see Beaton, M.J. and T. Cavalier-Smith. 1999. "Eukaryotic non-coding DNA is functional: evidence from the differential scaling of cryptomonal genomes" Proc. R. Soc. Lond. B. 266:2053-2059).

UCSD and Japanese researchers have found functionality for a pseudogene in a mouse. A *Nature News* Story notes that evolution has led researchers to believe that "'[p]seudogenes' are produced from functional genes during evolution, and are thought to be simply molecular fossils" and that the evolutionary expectation that they are functionless makes this an "unexpected discovery of a biological function for one pseudogene [that] challenges popular belief." This "pseudogene" apparently regulates regulation of messenger-RNA on a different chromosome. The article ends with a profound question that both evolutionists and design theorists ought to take seriously: "Might the pseudogene copies of other functional genes be similarly useful?"

It should be noted that intelligent design theory allows for *loss of function*, where something was originally designed functional, but perhaps function was lost due to various environmental factors. This could be seen as analogous to leaving brand new car out on a mountaintop. 500 years later, natural forces leave parts of it non-functional, although it was designed as initially functional.

Conclusion: To conclude, in *The Design Revolution,* intelligent design theorist William Dembski summarizes perfectly the current situation:

> For research within an accepted framework, peer review is useful for quality control. But for radical new ideas and thinking outside the box, peer review is more often a hindrance than a help. That should come as no surprise given the nature of peer review. Peer review is primarily in the business of seeing that the standards, norms, and practices of an established guild are respected. Only after they have been respected does the question of originality and innovation receive consideration. Peer review is essentially conservative. Peer review is therefore the last place we should expect to see a scientific revolution vindicated.
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> The history of peer review bears this out. As Frank Tipler has pointed out to me, the very idea of peer review as the touchstone for scientific truth and merit is a post Second World War invention. In physics, for instance, peer-reviewed journals were not the norm until after 1950. In Germany, during the "Beautiful Years" -- the period when quantum mechanics was being invented in the 1920s -- one of the leading German physics journals, Zeitschrift für Physik, was not peer-reviewed: any member of the German Physical Society could publish there by simply submitting the paper.
>
> Hence, if you had a really wild idea, all you had to do to get it published was ask a member of the German Physical Society to submit it for you. If you were a member, you could of course submit it for yourself. Heisenberg published his paper on the uncertainty principle in this journal, and Friedmann published his paper on the Friedmann universe (now the standard cosmological

model) there as well. No peer review. Lots of brilliant physics.

All these observations about the history and nature of peer review are no doubt very interesting, but critics of intelligent design are unlikely to be impressed. It's all very well to say that design theorists publish work in the peer-reviewed literature that supports intelligent design. But intelligent design's main focus is biology. Are design theorists publishing and having work that supports intelligent design cited in the peer-reviewed biological literature? In other words, are we actually making inroads into mainstream biology? Design critics like Eugenie Scott, Paul Gross, and Barbara Forrest will often state publicly that design theorists have published exactly ZERO articles in the peer-reviewed biological literature that support intelligent design.

Where do they get the number ZERO? I happen to have in front of me articles from the Proceedings of the National Academy of Sciences, Journal of Molecular Biology, Journal of Theoretical Biology, Origins of Life and Evolution of the Biosphere, and Annual Review of Genetics (the latter explicitly citing my book No Free Lunch). They are all written by design theorists and listed in the ISCID bibliography (www.iscid.org/bibliography/bibliography.php). They all, in my view and that of its authors, support intelligent design. But that's just the problem. How can anything support intelligent design?

Critics like Eugenie Scott, Paul Gross, and Barbara Forrest don't just deny that design theorists have published any works in the peer-reviewed literature that support intelligent design. They also deny that there could be any evidence at all that supports intelligent design. Yes, the articles I'm looking at are by design theorists. And yes, they are in the peer-reviewed biological literature. Yet according to critics they can't support intelligent design. But is it that no evidence supports intelligent design? Or is it that plenty of evidence supports it provided that evidence is not ruled inadmissible on a priori grounds? Apriorism has an unhappy place in the history of science. For instance, science in Kepler's day knew that the orbits of the planets had to be circular (Kepler's contemporary Galileo was adamant on this point). Thus Kepler's evidence for elliptical orbits was ruled inadmissible because science "knew in advance" that the orbits had to be circular. In the end, however, Kepler was vindicated and the apriorist science of his day had to backpedal. That's always the danger with apriorism in science.

Critics of intelligent design who want to maintain that the number of articles in the peer-reviewed biological literature that support intelligent design is ZERO are playing a losing hand. That fiction is becoming increasingly difficult to maintain. Even so, I expect it to be maintained for a time. The problem is that to get work that supports intelligent design published in the peer-reviewed biological literature, biologists who are design theorists have to play their cards very close to the vest. As Michael Behe pointed out in an interview with the Harvard Political Review (www.hpronline.org/news/251835.html), for a biologist to question Darwinism endangers one's career: "There's good reason to be afraid. Even if you're not fired from your job, you will easily be passed over for promotions. I would strongly advise graduate students who are skeptical of Darwinian theory not to make their views known."

In the current intellectual climate it is impossible to get a paper published in the peer-reviewed biological literature that explicitly affirms intelligent design or explicitly denies Darwinian and other forms of naturalistic evolution. Doubting Darwinian orthodoxy is comparable to opposing the party line of a Stalinist regime. What would you do if you were in Stalin's Russia and wanted to argue that Lysenko was wrong? You might point to paradoxes and tensions in Lysenko's theory of genetics, but you could not say that Lysenko was fundamentally wrong or offer an alternative that clearly contradicted Lysenko. That's the situation we're in. To get published in the peer-reviewed

literature, design theorists have to tread cautiously and can't be too up front about where their work is leading. Indeed, that's why I was able to get The Design Inference published with Cambridge University Press but not No Free Lunch, which was much more explicit in its biological implications.

By the way, you may be wondering why I don't here simply provide a list of peer-reviewed articles by design theorists from the biological literature that support intelligent design. The reason is that I want to spare these authors the harassment they would receive if I listed their work. Overzealous critics of intelligent design regard it as their moral duty to keep biology free from intelligent design, even if that means taking extreme measures. I've known such critics to contact design theorists' employers and notify them of the "heretics" in their midst. Once "outed," the design theorists themselves get harassed and harangued with emails. Next, the press does a story mentioning their unsavory intelligent design associations (the day one such story appeared, a close friend and colleague of mine mentioned in the story was dismissed from his research position at a prestigious molecular biology laboratory -- he had worked in that lab for ten years). Hereafter, the first thing that an Internet search of their names reveals is their connection with intelligent design.... Welcome to the inquisition.

I close with one final point about peer review. Although intelligent design research is being published and cited in the peer-reviewed scientific literature (including the biological literature), even if it were not, that would not invalidate intelligent design. Lack of peer review has never barred the emergence of good science. Nor for that matter have peer-reviewed journals been the sole place where groundbreaking scientific work was done. As I noted, the peer-review process is inherently conservative, working nicely for filtering good incremental science from less rigorous work within an established paradigm, but it is lousy at opening its arms to paradigm revolutions. Thomas Kuhn, along with other eminent historians of science, have settled this point definitively: the old guard never opens its arms to a scientific revolution; they have too much invested in the old paradigm. The most important revolutions in science bypassed the peer-review process entirely and appeared in books. Copernicus's De Revolutionibus, Galileo's On Two World Systems, and Newton's Principia are cases in point. None of these works were peer-reviewed. Nor was that book by a retiring English biologist from the nineteenth century -- an unconventional work titled On the Origin of Species.