A Critical Evaluation of the Intelligent Design Program: An Analysis and a Proposal

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I. Introduction

If the ID program is going to have a real impact on science, however, it needs a positive program that will provide scientists with an alternative methodology that they can use to make new, fruitful discoveries. Without this, scientists will fall back into using methodological naturalism by default; Darwinism and other naturalistic research programs would thus still be the only games in town. And this would occur even if individual scientists came to believe that the world and life were designed. Moreover, if advocates of ID can come up with a positive program, this lowers the burden of proof they bear. For example, they would no longer feel as much need to *prove* that unguided, naturalistic evolution is false. Rather, they could simply argue that there are enough problems with it to merit serious investigation of an alternative. For example, Michael Behe would not need to prove that there is no Darwinistic explanation of certain highly complex biochemical systems--which his critics are correct in pointing out is virtually impossible since the Darwinist can always simple respond that we have not tried hard enough. Instead, all Behe and others would have to argue is that these systems present enough difficulties for Darwinism to merit looking at an alternative program. Furthermore, it would certainly help Behe's case if the broad outlines of such an alternative program were at least partially worked out. I will attempt to sketch one possible way of doing this in this paper.

At least two major options for developing the design program initially present themselves. These are:

> *Option 1*: Treat the ID hypothesis as a *scientific hypothesis* that is relevantly analogous to other scientific hypotheses, such as the big bang theory, the theory of continental drift, or Darwinian evolution.
>
> *Option 2*: Instead of treating the ID hypothesis as a scientific hypothesis, treat it as what I call a *metascientific* hypothesis that can influence the framework from within which we do science in a given domain.

I will reject option #1 in favor of option #2, at least insofar as we require that scientific explanations provide a detailed, scientifically explicable explanation of natural phenomena. Thus, I will subscribe to a limited version of methodological naturalism: namely, insofar as a scientific hypotheses provide *detailed, scientifically explicable* explanations and predictions of natural phenomena, they must only make reference to natural entities, processes, and patterns. The reason for this restriction is not that science is *a priori* defined as naturalistic, but rather that detailed scientific explanations of a phenomena require that one elaborate, through scientific means, the internal dynamics of the hypothesized cause of the phenomena. This, however, will leave room for one to consider design as an *ultimate* explanation of certain phenomena. Whether ultimate explanations should be included in science, even if they cannot be used to make detailed, scientifically explicable explanations and predictions, is a pragmatic concern that I will briefly address at the end of this paper.

II. Definitions, Distinctions, and Clarifications

1. Definition of *scientific tractability*:

An important concept for our argument will be the idea of an hypothesis being *scientifically tractable*. An hypothesis will be defined as being *scientifically tractable* if and only if through scientific and empirical means we can develop and test models of its "internal dynamics"--that is, models that flesh-out the details of the structures postulated by the hypothesis. To illustrate, consider the *big bang* theory. Since the time it was originally proposed in the 1920's, scientists have used developments in fundamental particle physics and general relativity to create sophisticated models of its internal dynamics as far back as the first 10^{-45} seconds onward. Then they have used these models to account for various features of the universe and to derive various predictions, such as the existence of a uniform low-temperature (3^0 K) background radiation and the relative abundance of Helium in the universe. Furthermore, they have used various known features of the universe to further refine their models.

Or consider the theory of *continental drift.* Although this theory was initially proposed as an explanation of the similarity in the ancient animal and plant life between Africa and South America and the apparent fit between these two continents, the theory only really received serious consideration when scientists could construct plausible accounts of its internal dynamics through the newly developed science of plate tectonics. Finally, consider Darwinian evolution. Although Darwinian evolution might not be falsifiable in Karl Popper's sense, it is scientifically tractable. We can develop models of how chance and natural selection--the driving force behind Darwinian evolution--might have worked in the past. For instance, we can develop and test models of mutation rates of various genes, of how the environment influences the process of speciation, and the like.

2. Definition of *Strong* versus *Weak* Scientific Tractability:

An hypothesis will be said to be tractable in the *strong* sense if, given the background theories at the time, it either implies or strongly suggests a well-specified class of models for its internal dynamics or structure. (By a "well-specified" class of models I mean a class of models that are sufficiently similar and worked-out so that they have the potential of making significant common predictions and providing significant common explanations of phenomena.) For example, the big bang theory is scientifically tractable in the strong sense because, given developments in modern subatomic physics, it implies well-specified class of models for its internal development, such as the so-called standard model and various inflationary scenarios. Although these models differ significantly in their account of the very early universe (from 10^{-45} to 10^{-30} seconds), the standard model and the inflationary models coincide with each other after 10^{-30} seconds onward. Accordingly, they each invoke similar mechanisms and make many similar predictions for the later development of the universe (Guth and Steinhardt, p. 37).

The above example illustrates than an important feature of hypotheses that are scientifically tractable in the strong sense is that they tend to be directly testable via the class of models they imply or strongly suggest. The reason for this is that any predictions or explanations common to the class of models end up being predictions or explanations of the hypothesis in question since, given the other scientific information at the time, the hypothesis implies the class of models. Accordingly, such hypotheses have the potential of being directly explanatorily and predictively fruitful via the class of models they imply.

On the other hand, an hypothesis will be said to be scientifically tractable in the *weak* sense at a given time if it is tractable but does not imply any well-specified class of models. Because they do not imply a well-specified class of models, hypotheses that are scientifically tractable in the weak sense are not testable in any direct way. Instead, only the models spawned by such an hypothesis--that is, the various models that attempt to articulate its internal dynamics--are directly testable. And, only these models, not the hypothesis itself, could be said to have direct predictive and explanatory fruitfulness. Thus, hypotheses that are scientifically tractable in the weak sense are only fruitful, or fruitless, in the sense that they spawn, or fail to spawn, fruitful models of their internal dynamics. As an illustration, consider Darwin's theory of evolution by natural selection. At least when Darwin originally proposed his theory, it was mostly scientifically tractable in the weak sense. One could develop models of the dynamics of evolution by natural selection as later scientists attempted to do, but at the time Darwin's theory did not imply or strongly suggest any well-specified class of models. The range of possible mechanisms of evolution was still very broad. Even today with our knowledge of genetics, Darwin's theory is still to a significant extent only scientifically tractable in the weak sense. This is why there are several widely different models of how Darwin's theory is supposed to work, such as neo-Darwinism and punctuated equilibrium, thus making it difficult to directly test it. Instead, we must simply test the various models of its internal dynamics. Moreover, we must judge the fruitfulness of Darwin's theory based on the fruitfulness of these sorts of models, unless at some point it becomes scientifically tractable in the strong sense.

Several other examples of hypotheses that are weakly scientifically tractable are worth mentioning. First, consider Freud's psychoanalytic theory of the unconscious. Karl Popper and others severely criticized this theory because it was not falsifiable. For example, Popper cites how Freud's theory could account for two opposing behaviors -- that of a man who deliberately drowns a child and that of a man who sacrifices his life to save a child--by means of repression and sublimation, respectively. (1963, p. 35). Thus, Freud's theory was unfalsifiable in this case because no matter what behavior occurred, Freud's theory could account for it. What Popper failed to recognize was that the reason it was not falsifiable was that it was not scientifically tractable in the strong sense; rather, it was only tractable in the weak sense. For example, Freudians potentially could work-out various detailed models of the mechanism of repression and sublimation that were testable. The scientific merits of Freud's theory, therefore, must be judged on its ability to spawn testable and fruitful hypotheses, not its ability to be directly tested. Finally, consider the following three hypotheses: i) the Aristotelian hypothesis of the four types of causes which formed the basis of Aristotelian science; ii) the mechanical hypothesis that became popular with the scientific revolution in the sixteenth century; and iii) the pythagorean/platonic hypothesis that nature behaves in accordance with mathematical principles. Although in and of themselves these hypotheses were at best only minimally scientifically testable, since they are not specific enough to predict anything, they had the potential of spawning a variety of hypotheses that articulated their internal dynamics. For example, one cannot directly test Aristotle's hypothesis of the four causes--that is, efficient cause, formal cause, material cause, and final cause--since this hypothesis is not specific enough to predict anything. But, one could conceivably develop and test particular hypotheses regarding the operation of the four causes which could then be tested.

Eventually, the Aristotelian framework failed to spawn fruitful theories and thus was dropped in favor of a combination of the *mechanical hypothesis* and the *pythagorean/platonic* hypothesis starting in the fifteenth century. According to the mechanical philosophy, the physical world is ultimately composed of hard little particles that bump up against each other. Of itself, this philosophy was not directly testable, since once again it is not specific enough to imply any well-specified set of models of how these particles behaved. It did, however, spawn a variety of specific theories based on this idea--such as the eighteenth century particulate theory of light, the kinetic theory of heat, and Dalton's atomic theory--that could be developed and tested. Finally, consider the pythagorean/platonic hypothesis that nature behaves in accordance with simple, elegant, and "beautiful" mathematical laws, an hypothesis that has largely superseded the mechanical hypothesis in modern physics. Of itself, this hypothesis did not imply any testable predictions or explain any phenomena. But the structures hypothesized by this framework--that is, the existence of simple, elegant, and 'beautiful" mathematical systems of relations underlying phenomena--had the potential of being cashed-out and developed through empirical means, and these have been highly explanatorily and predictively fruitful. Galileo, Kepler, and Newton, for instance, developed highly fruitful mathematical models for mechanics, planetary motion, and gravity during the scientific revolution: Kepler's hypothesis that planets follow ellipses with the sun at one foci while tracing out equal areas in equal times and Newton's inverse square law of gravity are particular examples of such models. Moreover, modern physics, especially since the development of quantum mechanics, has primarily consisted of a development of these mathematical systems of relationships, such as the Hilbert space operator relations in quantum mechanics. These mathematical systems have then been used to account for an extraordinarily wide-range of phenomena.

From now on, I shall stipulate that an hypothesis is a "*scientific hypothesis*" insofar as it is a scientifically tractable. I will not argue here for the historical adequacy of this stipulation, but I do think it captures what has historically been at the core of science: namely, the development through empirical means of the internal dynamics of various hypotheses that purport to account for observable phenomena. It also captures, I believe, what differentiates science from other disciplines. For example, metaphysics also tries to explain and account for the world, but metaphysical hypotheses are typically not developed through empirical means. (Indeed, when they are, they are considered scientific hypotheses.) Similarly, theology is the study of God, the ultimate cause of the world, but it is not considered science since they do not use empirical means to discover the internal dynamics of God but rather appeal to special revelation. (Even though *natural theology* does use empirical findings to speculate about God, it typically does not use these findings to elaborate, and then test, these models; insofar as it does, I suggest, it would become part of science.)

My argument in the rest of the paper, however, does not hinge on accepting scientific tractability as being what makes an hypothesis scientific. If you do not agree that scientific tractability should be the criterion for whether or not an hypothesis is scientific, simply substitute "scientifically tractable" for "scientific " in the relevant places below.

3. Definition of a *Metascientific* Hypothesis

I shall define a *metascientific* hypothesis as an hypothesis that serves to provide a relatively broad framework from within which science can be practiced in a certain domain. Besides being scientifically tractable hypotheses, the Aristotelian hypothesis of four causes, the mechanical hypothesis, the pythagorean/platonic hypothesis, and to a lesser extent Darwin's evolutionary hypothesis and Freud's hypothesis of the unconscious, are examples of *metascientific* hypotheses. The mechanical hypothesis, for instance, gave the directive that we should explain all physical phenomena in terms of the motion of particles bumping into each other. Thus, it provided a framework from within which particular theories, such as the particle theory of light or the atomic theory of matter, could be constructed. The pythagorean/platonic hypothesis, on the other hand, gave the directive that physical phenomena were to be accounted for by finding a simple, elegant set of mathematical rules or structures from which they could be derived.

To illustrate how these directives work, consider the fact that Newton's theory of universal gravity was resisted by scientists and philosophers for over a hundred years because it did not provide a "mechanical explanation"of how one mass could attract another: these scientists and philosophers accused Newton's theory of invoking "occult powers" of action at a distance since it did not offer any such explanation. Even Newton himself felt obliged to search for a mechanical explanation to legitimize his theory. Only with the extraordinary success of Newton's theory of gravity did the need to find a mechanical explanation eventually die out, being replaced by the pythagorean/platonic criteria of what counts as an adequate explanation. Accordingly, scientists and philosophers began to consider the fact that phenomena such as the motion of the planets could be derived from a simple, elegant mathematical relation expressed by Newton's law as a sufficient scientific explanation of the phenomena. The transition to the platonic/pythagorean framework, however, was not complete in physics until this century with the development of the three core theories of modern physics--that is, special and general relativity and quantum mechanics--which account for phenomena by showing how they can be derived from a simple, elegant, mathematical formalism. Today, work in fundamental theoretical physics largely consists of in developing new mathematical frameworks by extending, and innovating on, the mathematical framework given by these three theories. Quantum field theory, for instance, was developed by combining together in a semi-consistent way the Lagrangian formalism of classical field theory, the Lorentz invariance condition of special relativity, and operator relations of standard quantum mechanics. One then explains phenomena in the new domain by showing how they fit into the newly developed mathematical system of relations.

What the history of Newton's theory of universal gravity, and the history of physics in this century, illustrate is the power of a metascientific hypothesis both to dictate what kinds of theories scientists construct, and what counts as an adequate explanation of phenomena. Of course, many more illustrations of the power of metascientific hypotheses could be given from the history of science, such as the radical shift in the methodology and goals of science that occurred during the Scientific Revolution with the shift from the Aristotelian hypothesis to a combination of the mechanical hypothesis and the pythagorean/platonic hypothesis. We will not go into these examples here, however.

One characteristic of metascientific hypotheses is that, when they are scientifically tractable at all, they are typically only scientifically tractable in the weak sense. This means that usually metascientific hypotheses themselves are not directly scientifically fruitful because they are not specific enough to entail anything. Rather, *metascientific hypotheses are typically explanatorily and predictively fruitful only insofar as they provide a framework that allows for the development of particular theories that are fruitful*. During this century, for example, the pythagorean/platonic hypothesis has been very fruitful because it has spawned extraordinarily fruitful mathematical theories in fundamental physics.

In my sense of the term, a metascientific hypothesis can be thought of as providing what the imminent historian and philosopher of science Imre Lakatos calls the "hard-core" of a research program. According to Lakatos, the hard core is never directly tested or involved in explanation and prediction, but rather serves to suggest various lower-level hypotheses that are testable and that can be used in explanation and prediction. Fram Lakatosian perspective, therefore, the major test of a metascientific hypothesis then becomes whether or not it leads to a progressive or degenerative research program. It should be noted, however, that as I am thinking of it, metascientific hypotheses are typically much broader in scope than the usual examples--such as Newtonian physics--of hard-cores presented by Lakatos and others.

III. ID as a Metascientific Hypothesis

ID as Crucially Disanalogous to Other Scientific Hypotheses

In this subsection I will argue that the ID hypothesis is crucially disanalogous to other scientific hypotheses and thus that we should reject option #1 of section I above--that is, the option under which we consider ID as a scientific hypothesis. (In the next section, however, I will argue that properly construed, ID can be considered a scientific *research program*.)

A major disanalogy between the ID hypothesis and other scientific hypotheses is that the ID hypothesis fails to be *scientifically tractable*, at least insofar as the appeal to a trancendent intelligent agent as the designer: that is, an agent that transcends the confines of this universe. (As defined above, an hypothesis is scientifically tractable if and only if through scientific and empirical means we can develop and test models of its internal dynamics, often through applying the scientific results we have obtained in other domains.) Suppose, for instance, one claims that the designer is the monotheist's God. Almost all monotheists would agree that one cannot significantly develop and test models of God's internal dynamics through scientific means, since we cannot use science to significantly probe and test God's psychology. On the other hand, suppose one adopts Michael Behe's proposal (and that of many leading advocates of ID) to leave unspecified the nature of the designer. If we take this approach, then it is difficult to see how the intelligent design hypothesis could even be minimally scientifically tractable, since we would be unable to say much of anything about the internal dynamics of the designer.

I believe that the claim that the hypothesis of an intelligent designer fails to be significantly scientifically tractable is a precise way of articulating the common objection to the intelligent design program that it is a "science stopper." According to this criticism, invoking an intelligent designer to explain various features of the world reduces to nothing more than saying "God did it," and thus ends up leaving little for scientists to do in trying to find out the underlying causes of phenomena. Thus, the argument goes, even if such a designer exists, we should assume for methodological purposes that every phenomenon is explicable in terms of natural causes. I believe that there is something right about this criticism which we ignore at our own peril: namely, that scientific tractability makes an hypothesis something scientists can constructively develop. Moreover, as explained above, scientific tractability in the strong sense is what primarily makes an hypothesis scientifically testable.

But, one might object, isn't science a search for the true causes of the world and the true nature of physical reality? If so, doesn't the fact that an intelligent designer is the true explanation of the origin of life and the world make it a scientific hypothesis? I think the answer is “no,” as we can see by looking at some examples. Consider, for example, platonism in mathematics--that is, the position that numbers and other mathematical objects really exist in a mind-independent realm. Many philosophers and scientists, such as physicists Paul Davies and Roger Penrose, consider this the only adequate explanation of the success of mathematics in the sciences. Yet, no one considers platonism a scientific hypothesis, and the reason I suspect is that it is neither scientifically tractable nor significantly empirically testable; rather, it is considered a metaphysical hypothesis. [1]

Or, consider the theistic explanation of the big bang. Although many theists think that this is the only adequate explanation of the origin of big bang, I do not know of any theist who considers it a scientific hypothesis, at least not in the sense that they are encouraging scientists to empirically investigate and develop the theistic explanation. Rather, these theists consider it a metaphysical hypothesis that is supported by scientific evidence. [2]

One might also object at this point that we infer to designers all the time in the science of archeology, and consider the hypothesis of such designers scientific. Moreover, one might further point out that the scientific nature of the search for extraterrestrial life depends on taking the design hypothesis as being scientific. These points are correct, but there is a crucial difference between hypothesizing mundane designers, such as ancient people groups or extraterrestrials, and hypothesizing transcendent designers: namely, the internal operation of mundane designers is often significantly scientifically tractable, whereas the internal operation of a transcendent designer is not. Consider, for instance, an archeological explanation of various pieces of pottery found in a dig. This sort of explanation might include invoking such factors as the practical needs of the people (e.g., the need to store large amounts of grain), the artistic and religious life of the people, and their psychology. In other words, we would develop a model of their internal cultural and psychological dynamics by extrapolating from what we know about our own human psychology and then use that model to explain their artifacts. Similarly, since extraterrestrials are embodied beings occupying the same universe as ourselves, we can make plausible hypotheses about their internal psychology based on analogies with ourselves. For example, like ourselves, it makes sense that they would build shelters, and construct devices for growing food; and it makes sense that, like ourselves, they would transmit mathematically encoded radio signals in an attempt to let other intelligent beings know that they exist. Thus, if we found such signals or shelters, we could explain their existence by appealing to the internal psychology of extraterrestrials, and even develop models of how they might think.

The Design Hypothesis as a Metascientific Hypothesis

Because of the above crucial disanalogy between the design hypothesis and paradigm examples of scientific hypotheses, I propose that it is best not to consider the design hypothesis a scientific hypothesis. Rather, I propose, we should consider the design hypothesis a *metascientific* hypothesis that provides a broad framework which allows for more specific, scientifically tractable hypotheses to be developed and tested. In particular, the design hypothesis allows for a whole range of theories of life's origin and nature that would be tend to be excluded (or at least considered much less plausible) on a naturalistic metaphysics. Consequently, the design hypothesis allows for hypotheses that would typically be rejected from the very start under a naturalistic metaphysics because they are suggestive of design, even though each of these hypotheses only appeal to natural entities and processes, and thus fall under the strictures of methodological naturalism.[3]

Examples of such a hypothesese are: (i) the hypothesis that the basic genetic information for life began in the Cambrian era fully formed, and then evolved to form the creatures we have today; (ii) the hypothesis that the various kinds came into being fully formed at various epochs in earth's history (Notice that this is just the theory of *progressive creationism* with the reference to a designer removed.); iii) the hypothesis that life began less than 20, 000 years ago and that the fossil record is the result of a great flood. (Notice that this is simply the theory of *young earth creationism* with the reference to God removed.) ; (iv) the hypothesis that jumps in information occurred during life's development that go far beyond what we can adequately explain on the basis of natural selection; (v) The hypothesis that there exists "designlike" patterns that cannot be accounted for by unguided, naturalistic evolution. (For instance, the hypothesis that the extensive similarities between the marsupials and placentals goes beyond what can be explained by co-evolution is a specific version of this hypothesis since it hypothesizes a designlike pattern (a set of similarities) that evolution cannot explain. (vi) The hypothesis that there is some sort of teleological pattern in evolutionary development, perhaps as a result of the laws of nature and other constraints. This view has recently been suggested by the renowned paleontologist Simon Conway Morris (2000, 2002), and though not strictly at odds with a naturalistic metaphysics, makes more sense under the design hypothesis. (vii) The hypothesis that biological systems, such as the cell, are so complex that they are best viewed as complex information systems. This idea fits better with design than metaphysical naturalism, and has been suggested by University of Chicago biochemist James Shapiro (1997) and philosopher William Dembski (1999); (viii) The idea that there are specifically biocentric laws, a view suggested by theoretical physicist Paul Davies (1999, 1988), and Rupert Sheldrake (1981), though in very different ways. (ix) Michael Behe's hypothesis that some molecular systems exhibit *irreducible complexity* is an example of this since it involves the hypothesis of a molecular system displaying a complex, designlike pattern that cannot be explained by naturalistic evolution.[4]

(Xi) And finally, miscellaneous ideas, such as that advanced by biochemists Michael Denton and Craig Marshall (and published in the prestigious journal *Nature*), according to which "Protein folds found in nature represent a finite set of built-in, platonic forms. Protein functions are secondary adaptations of this set of primary, immutable, natural forms." (Vol. 410, March 22, 2001; also see Denton and Marshall, 2002, and Denton, 1998) Of course, for Denton and Marshall, the existence of these forms are ultimately the result of the the laws of physics.

Notice several features of the above hypotheses. First, none of them make reference to a designer. Second, they are all clearly scientifically tractable, as we will further show below. Indeed, to some extent they are scientifically tractable in the strong sense, although as sketched above they mostly are scientifically tractable in the weak sense.[5]

Third, hypothesis (i), (ii), and (iii) are analogous to the big bang theory: just as the big bang theory says the universe started suddenly at some point of time in the past (the singularity) and then the matter and energy in the universe developed according to processes describable by the laws of physics, each of the these hypotheses says that the basic kinds of life originated suddenly at some point in the past, and then developed according to scientifically understandable biological laws. Moreover, just as the big bang theory does not tell us where all the matter and energy in the universe came from, these hypotheses do not provide any explanation of where life came from. Nonetheless, like the big bang theory, they are scientifically tractable, since we can use standard biological science to develop models of how life developed from its point of origination, much as we can develop models of how the big bang developed from its point of origin. Furthermore, we can use these models to make detailed predictions and explanations of various biological phenomena

Moreover, notice that, just as in the big bang theory, no additional scientific work is done if we add to the above hypotheses the claim that God, or some other transcendent intelligence, created or designed life on earth. In the big bang theory, for instance, neither the claim that God created the big bang, nor that it occurred uncaused, gives the hypothesis any significant additional explanatory or predictive power. Theists, for example, might find it philosophically necessary to hypothesize a creator to account for the big bang, but it is best not to consider such an hypothesis part of science since it is not scientifically tractable, and adds nothing of interest scientifically. Similarly, the hypothesis that some designer created the basic kinds will not give hypothesis (ii) above--that is, the hypothesis that the basic kinds simply appeared fully formed at various points in earth's history--any additional explanatory or predictive power.

And the reason for this is that the designer's psychology is not scientifically tractable: we cannot form models of the designer's internal dynamics. Of course, in analogy to the big bang, one might nonetheless feel philosophically compelled to hypothesize a creator to explain the origination of life.

The above does not mean that one should not include the designer's creative act as part of the hypothesis under consideration; but we should recognize that this additional part of the hypothesis does not do any "scientific" work because it is not scientifically tractable. So, for instance, instead of merely adopting hypothesis (ii) above according to which the various biological kinds appeared fully formed in various epochs of earth history, one could add that God created them this way, as progressive creationists do. Doing this is fine as long as one recognizes that this addition does not do any scientific work.

As an additional illustration, consider the hypothesis of *young earth creationism*, which claims that God created the universe and all major life forms in six days somewhere around 10,000 years ago and that there was a world-wide flood which gave rise to the fossil record. This hypothesis can be separated into two parts: i) the claim that the universe and all major life forms originated in six days around 10,000 years ago and that a world-wide flood occurred which created the fossil record; and ii) the claim that God brought these things about. The first part of the hypothesis is clearly scientifically tractable . Hence young earth creationists, for instance, have attempted to develop models of the internal dynamics of the flood using the science of hydrology and then have attempted to use that model to provide detailed explanations of and predictions regarding various geological phenomena. Similarly, under this hypothesis one could use standard genetics to develop models of the diversification of life on earth after the initial time of creation, and then test these models. Thus, it seems clear that part (i) of the young earth creationist's hypothesis is scientifically tractable, even though I think the evidence to date is overwhelmingly stacked against this hypothesis, and thus for this reason do not think it should be considered part of science. On the other hand, part (ii) of the young earth creationist's model is not scientifically tractable, and thus is not significantly testable, since we cannot really develop models of the internal dynamics of God's creative acts, at least not through scientific means. Thus, it does not do any additional scientific work. Nonetheless, young earth creationist's feel a need hypothesize God to explain the origin of the universe, life, and the flood under this hypothesis, much as many theists feel a need to postulate God to explain the origin of the matter and energy in the big bang. Of course, I am not claiming that any of possible models listed above adequately supported by the evidence or even plausible, just that the belief in a designer at least places them on the table for initial consideration, instead of them just being ruled out *a prior*.

Finally, I think that having belief in a designer, particularly a theistic designer, as a metascientific hypothesis would have implications for forefront issues in science outside of biology. For example, theism suggests that beauty, instead of mere simplicity, is the appropriate criterion to apply for judging scientific theories, since given that God has a perfect aesthetic sense, we have good reason to believe that God would create a world that is beautiful. The only reason we have for believing that God would create a world that is simple, is that simplicity is an important part of the classical form of beauty, as for example found in Greek architecture. As William Hogarth stated, the classical idea of beauty is that of simplicity with variety. Theism not only accounts for why the criterion of both simplicity and beauty has been so successful, but it also suggest that in many domains nature will exhibit more than the sparse sort of beauty that Weinberg and others claim is characteristic of the mathematical structures of fundamental physics (Weinberg, 1992: 149). Under a conception of God as infinitely creative and one who has a perfect and deep aesthetic sense, for example, it would make sense for the fabric of creation to be richly interconnected and interwoven, in clever, deep, subtle, and elegant ways, expressive of many different types of beauty from the sparse classical sort of beauty to the more “postmodern” with its wild extravagance, as characteristic of the evolution of life on earth.

Among other things, such a rich view of nature has the hope of providing the needed room and subtlety in nature for grounding a truly sacramental view of nature, along with more adequate accounts of divine action and non-reductive accounts of the mind-body relationship. To illustrate, several philosophers have argued that non-reductive accounts of the mental would involve an enormous complexity of laws linking mental states (such as sensations and experience) with the brain. The leading materialist philosopher J. J. C. Smart has taken this as a powerful argument for reductionism (1970: 54), whereas philosopher Robert Adams (1987) takes this as a strong reason to appeal to God, *instead* of science, to account for the relation of the mind to the body. If elegance and beauty are taken as fundamental ideals of natural order instead of mere simplicity, both arguments are misguided since they assume legitimate scientific explanations must be simple. Rather, we would expect some domains of nature to express those sorts of beauty that involve a high degree of complexity at the fundamental level. (Similar things could be said concerning speculation about forefront issues such as biocentric laws, higher-level patterns of teleology in evolution, such as explored by Teilhard Chardan (1955), Simon Conway Morris (2004), and the like.) More generally science should be focused on finding intelligible (and in many cases, elegant) patterns in nature, instead of the ideal being explaining reality in terms of the causal powers of a few basic constituents, though certainly this latter form of explanation is of value in some domains.

IV. Advantages of my Proposal

There are several advantages in considering the design hypothesis as a metascientific hypothesis that provides the framework for science instead of itself being a scientific hypothesis:

1. My proposal provides a clear methodology for the ID program: develop and test the various new scientific hypotheses *spawned* by the ID hypothesis--that is, those theories, such as the ones listed above, that are more plausible under the design hypothesis but not under metaphysical naturalism (unless the metaphysical naturalist allows for panspermia). This will clearly give scientists a positive program to pursue. (A common, though perhaps false, perception of the "ID program" has been that IDers are simply claiming that an intelligent designer is the best explanation of certain biological systems, or certain aspects of the history of life on earth. In itself, however, this claim does not give scientists much with which to work, but simply amounts to saying a designer created life and then going home.)

2. My proposal clearly circumvents many of the major objections to the intelligent design program, such as: i) the objection that the hypothesis of an intelligent designer is not scientific; ii) the objection that it is a "science stopper"; or iii) the objection that it lacks explanatory and predictive fruitfulness. It circumvents objection (i) because under my proposal the design hypothesis does not claim to be a scientific hypothesis, but rather a metascientific hypothesis that provides the framework within which scientific hypotheses are formed. Moreover, the hypotheses developed within this framework, such as the hypothesis that basic genetic information for all major life forms arose suddenly at various epochs in earth's history, are clearly as scientific as the big bang theory, which claims that all matter and energy began at some finite time in the past. It circumvents objections (ii) and (iii) since clearly the hypotheses spawned by the ID hypothesis are scientifically tractable in the same sort of way the big bang is scientifically tractable.

3. As indicated by (1) and (2) above, viewing the design hypothesis as a metascientific hypothesis helps keep advocates of ID from trying to defend and develop the ID hypothesis in inappropriate ways--such as trying to defend the ID hypothesis as testable in the same sort of way that other scientific hypotheses are, or attempting to draw predictions directly from the design hypothesis. Instead, as pointed out in (1) above, under my proposal one should develop and test particular hypotheses spawned by the design hypothesis, and then judge the merits of ID on the fruitfulness of these hypotheses.

4. Viewing the design hypothesis as a metascientific hypothesis shows that the ID framework could be less dogmatic and has the potential of being more scientifically fertile than the naturalistic framework, since it allows for a far broader range of possible hypotheses. Under my proposal, the ID framework not only allows for Darwinian evolution, since the designer could have brought about all life through the process of natural selection, but it allows for a whole range of other hypotheses virtually excluded by a naturalistic framework. So, by allowing a far greater range of hypotheses that we can develop and test, it has the potential of being far more fruitful.

5. Viewing the design hypothesis as a metascientific hypothesis shows that the design hypothesis is not committed to teleological explanations in nature--that is, explanations of phenomena involving reference to their purpose or their Aristotelian "final cause." This will be an advantage to those who think that teleological explanations as a return to an outmoded and unfruitful Aristotelian form of science that was

repudiated during the scientific revolution from the fifteenth to seventeenth centuries. On the other hand, ID does allow for the return of these sorts of explanations. This will be an advantage for those who think teleological explanations--such as explaining the parts of an organ in terms of the organ's function--are scientifically useful in certain domains.

6. Treating the world as if it were designed, particularly by God, has a very important precedent. As Morris Kline, one of the most prominent historians of mathematics, points out, "From the time of the Pythagoreans, practically all asserted that nature was designed mathematically .... During the time that this doctrine held sway, which was until the latter part of the nineteenth century, the search for mathematical design was identified with the search for truth. " (1972, p. 153.) For example, although Einstein did not believe in God, he seems to fruitfully treated the world *as if* it were created by a deity: as one of his main biographers, Banish Hoffman notes, "When judging a scientific theory, his own or another's, he asked himself whether he would have made the universe in this way had he been God. This criterion . . . reveals Einstein's faith in an ultimate simplicity and beauty in the universe. Only a man with a profound religious and artistic conviction that beauty was there, waiting to be discovered, could have constructed theories whose most striking attribute, quite overtopping their spectacular successes, was their beauty." (Albert Einstein: Creator and Rebel). Further, as is well known, Galileo and Kepler both operated under the assumption that God was a great mathematician, with Galileo famously remarking in his book *the Assayer* (1623) that "book of nature is written in the language of mathematics."

In this sense, most theoretical physicists working on the fundamental theories of the universe treat the world as if it were mathematically elegantly and beautifully designed. (For a very technical book that argues that theoretical physicists implicitly assume that naturalism is false in the way they practice science, see Mark Steiner's *Mathematics as a Philosophical Problem,* Harvard University Press, 1998. Paul Davies, along with several other authors, have also argued for a similar thesis, though in a less technical way–e.g., see Davies, *Superforce*,1984, pp. 222-43.) *The crucial question, which I think deserves serious exploration, is whether treating the world as if it were designed might be fruitful outside of the realm of physics*.

7. It is interesting to note that all the above authors mentioned in connection with new hypotheses in biology (Behe, Davies, Denton, Conway Morris, etc.), except perhaps James Shapiro, believe in some sort of an intelligent designer. This might explain why they are willing to explore unorthodox, though entirely naturalistic, explanatory hypotheses in biology, confirming my claim that belief in such a designer can influence how one does science.

8. Although I have nothing against inference to a designer, or invoking a designer as an ultimate explanation, I think philosopher and historian of science Imre Lakatos was correct in his claim that science is mostly about constructing explanatorily and predictively progressive research programs. As I mentioned above, under my way of viewing ID as a metascientific hypothesis, we can consider it as a research program in which the hypothesis of an intelligent designer serves as what Lakatos calls the *hard core* of the research program, which according to Lakatos is never directly tested or involved in explanation and prediction, but rather serves to suggest various lower-level hypotheses that are testable and that can be used in explanation and prediction. From a Lakatosian perspective, therefore, the major test of ID as a metascientific hypothesis is whether or not it leads to a progressive or degenerative research program.

V. Conclusion

Finally, I would like to end by addressing four possible misunderstandings. First, when I claim that it is best not to consider the ID hypothesis a scientific hypothesis, I am not appealing to some definition of the essence of what science is all about. Rather, I am claiming that, for the sorts of reasons listed above, it makes more sense to consider the design hypothesis a metascientific hypothesis. Second, when I claim that it is best not to consider the ID hypothesis a scientific hypothesis, I am not claiming that there is no scientific evidence for the existence of a designer. Rather, I am claiming that it fails to be significantly scientifically tractable. I believe that many times advocates of the ID program has been confused on this issue: often, they seem simply to think that one can establish the scientific legitimacy of ID by showing that the findings of biology or cosmology provide evidence for an intelligent designer. But, as pointed out above in the case of the theistic explanation of the big bang theory and the platonic hypothesis in the foundations of mathematics, we can have evidence for an hypothesis, without the hypothesis being a scientific hypothesis (or even a metascientific hypothesis for that matter). Third, I should note that I am not adamantly opposed to considering ID a scientific hypothesis, though I think it is best not to. However, I would say to those who still want to consider ID scientific that they should recognize that it is disanalogous to other scientific hypotheses in that it is not significantly scientifically tractable, and that this has important implications for how one should develop the ID program.

Fourth, whether or not my proposal ultimately is a good idea, I think it is critically important that advocates of ID examine various alternative strategies for developing the ID program. Advocates of ID must not refuse to look at other alternatives because of some ideological commitment to a single way of developing the ID. To refuse to fairly examine other alternatives will make ID more like a religious ideology where we must sign at the dotted line, and less like science, where supposedly rational disagreement is allowed. (After all, Isn't this what ID advocates accuse Darwinism and methodological naturalists of doing, namely, excluding other research programs on ideological grounds without giving them a fair hearing?) What should unite advocates of ID is not a commitment to a certain way of developing ID, but a belief that the existence of an intelligent designer could turn out to be very important to how one does science, however exactly that is cashed-out. Finally, I am not advocating that the scientific community in general adopt the design hypothesis as the framework from which science is practiced. Rather, I am proposing that the design framework, as articulated above, be considered a legitimate framework for some scientists to adopt – even if only as a useful fiction – as they theorize and evaluate hypotheses about the nature of the world.

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Notes:

1. Platonism might be minimally scientifically testable, however. For example, some have claimed that if Platonism is true, one would expect alien races to have developed the same mathematics as ourselves, whereas if some form of factionalism is true—according to which mathematics is a human construction—we would not expect this.

2. Other examples could be given, such as the metaphysical explanations of the laws of nature offered by so-called *necessitarians*—that is, those philosophers who claim that metaphysical necessities underlie the laws of nature. We will not go into these other examples here, however.

3. The only condition under which someone committed to a naturalistic metaphysics might accept one of these hypotheses is if they allowed for the remote possibility that the panspermia (that is, the "evolution from space") hypothesis might be true.

4. According to Behe, a complex system is irreducibly complex if there is no Darwinian evolutionary path from a significantly simpler system to the complex system—that is, if there is no path such that each significant increase of complexity on the path is one that aids in the survival of the organism.

5. For example, although hypothesis (v) clearly makes the general predictions that there are certain patterns that naturalistic evolution cannot explain, it does not make any specific predictions. But, by postulating the existence of such patterns, we could engage in a scientific research program to develop various models of these patterns which can then be tested and used to explain, or at least categorize, various biological phenomena. (Arguably, showing that a biological phenomenon fall sunder a general pattern could be considered to explain it in the same way that showing that a particular physical phenomenon falls under some general pattern—such as that expressed by Newton's law of gravity—is usually considered a sufficient explanation of the physical phenomenon.)