An Intelligent Discussion of Intelligent Design

Recent years have witnessed increasing (and oftentimes contentious) discussion regarding the phenomenon known as Intelligent Design. The topic has been given significant coverage in the mainstream media, in a slew of best-selling books, and in numerous university campus debates, yet much ignorance remains concerning its principle claims. It is the purpose of this publication to clearly and concisely explain the most fundamental tenets of Intelligent Design and to dispel a number of widespread misunderstandings and caricatures of ID.

Intelligent Design: What It Isn't, What It Is

The most difficult obstacle to engaging in fruitful discussion of Intelligent Design is the pervasive misrepresentations of ID in the popular media. Many of the leading critics of ID—along with legions of uninformed bloggers and journalists—allege that it is a right-wing political agenda under the guise of science, a thinly-veiled ploy to smuggle Biblical Creationism into public school science classrooms, a type of pseudo-science akin to Flat Earth Geology, an expression of incredulity ("it's so complex and/or improbable that God must have done it"), or an argument from ignorance ("we don't know how it happened so it must be God's doing"). However, these claims do not hold up under close inspection. Yet before their spuriousness can be demonstrated, it must be explained what Intelligent Design actually consists in.

The central claim of ID is that certain living systems bear the unmistakable marks of intelligent design. At the core of ID is a formal, empirical approach to the detection of design in nature. (This paper will focus on intelligent design in biological systems, though much work has also been done regarding signs of intelligence in astrophysics.) Underlying this method is an intellectual framework for the natural sciences which maintains that determining whether or not intelligent design exists in the natural world is a matter that ought to be settled by careful examination of the relevant evidence rather than by the exclusion of design hypotheses *a priori* on the basis of philosophical presuppositions. Though interesting and important, this theoretical issue cannot be dealt with in any detail here. Instead, an attempt will be made to identify and precisely define the three main components of ID: irreducible complexity, specified complexity, and a theory of information.

Irreducible Complexity

In biology, the concept of irreducible complexity refers to any living system of interacting parts which functions in such a way that the removal of any of its parts causes the entire system to break down. Thus an irreducibly complex biological system requires every one of its interdependent components to be in place before it will function properly, if at all. This implies that it is virtually impossible for such a system to be constructed in a step-by-step manner *without guidance or input from an intelligent agent*. Any proposal that such a system was built in a gradual and completely undirected way will invariably be found wanting, for two reasons. One, on such a scenario the numerous stages of construction prior to the completion of the system would nearly always be functionally useless because such systems require all of their components to be present simultaneously (and in a highly-specific configuration) before they

will begin operating. Two, having no goal toward which it is being directed, it would be an astounding serendipity for a totally unguided process to assemble such a system, given the fact that the laws of physics and chemistry have no inherent proclivity to construct highly-complex, information-bearing mechanisms or systems.

Several prominent scientists and philosophers of science have argued for the importance of the concept of irreducible complexity in the biological sciences. Biochemist Michael Behe, in his book *Darwin's Black Box* (Free Press, 1996), fleshes out the concept of irreducible complexity by means of several concrete examples, including the bacterial flagellum (which functions as an outboard motor for the bacterium) and the system for generating antibody diversity in the human immune system. In each of these cases Behe shows that the mechanism in question has no useful purpose unless all of its parts are working in tandem. In *Evolution: A Theory in Crisis* (Adler & Adler, 1986), biochemist Michael Denton states that "each [bacterial cell] is in effect a veritable microminiaturized factory containing thousands of exquisitely designed pieces of intricate molecular machinery, made up altogether of one hundred thousand million atoms, far more complicated than any machine built by man and absolutely without parallel in the non-living world." And Michael J. Katz, in *Templets and the Explanation of Complex Patterns* (Cambridge University Press, 1986), writes: "In the natural world, there are many pattern-assembly systems for which there is no simple explanation. There are useful scientific explanations for these complex systems, but the final patterns that they produce are so heterogeneous that they cannot effectively be reduced to smaller or less intricate predecessor components…these patterns are, in a fundamental sense, irreducibly complex..." It is important to clarify that the claim here is not that certain biological systems display such a degree of complexity (where the type of complexity remains unspecified) that they are most likely the product of intelligent design. Any number of natural phenomena (crystalline solids, for example) exhibit significant structural complexity and yet are nicely explained as the consequence of the laws of physics acting upon matter which possesses the requisite chemical properties. Rather, the claim is that irreducibly complex biological systems defy purely mechanistic, materialistic explanations because there is no compelling reason to expect the fortuitous assembly of such systems as the result solely of processes which have no purpose or goal.

Specified Complexity

In his seminal work *The Design Inference* (Cambridge University Press, 1998), philosopher of science William Dembski defines specified complexity as the concurrence of a high degree of complexity with an independently-specified pattern. This definition is important because it precludes both mere complexity and mere improbability as constituting sufficient evidence for concluding that a given biological system was produced by a designing intelligence. Dembksi also provides a reliable method of determining whether a design inference is warranted as the best explanation of the complexity embodied by a particular phenomenon. This method, which he terms the Explanatory Filter, is intended to rule out a design inference in any case in which design is not unambiguously the best explanation for the phenomenon in question. Hence the Explanatory Filter requires the elimination of chance (non-deterministic events), necessity (the laws of physics and chemistry), and the combination of chance and necessity before it renders a design inference warranted. In order to justify a design inference in biology, then, it must first be

shown that neither chance, necessity, nor their conjunction are sufficiently probable explanations for the existence of a specific living system.

A couple of mundane examples may be helpful here. Every card shark knows that chance can account for the makeup of a hand dealt in a game of poker, despite the fact that any given combination of cards is highly improbable. Similarly, one need not refer to anything other than necessity to explain the resultant pattern of toothpicks on the floor after an opened box of them is dropped, though any particular configuration of toothpicks on such a scenario is exceedingly unlikely. But neither chance, necessity, nor the concurrent action of the two can serve to adequately explain the existence of something like the highly-efficient waste removal systems that operate in mammalian cells. This is because such systems are not only stunningly complex and exhibit a clear aim but also rely upon highly-specified information content; even a slight perturbation in the input of information will cause the system to malfunction or cease working entirely.

To be perfectly clear: the claim here is not simply that certain biological systems must have been intelligently designed because their existence is extremely improbable apart from their having been deliberately fashioned. (A counter-example to such an assertion is the pattern of static heard when a television set without a receiving antenna is turned on: the precise resulting configuration of sound waves is both highly improbable—given the total number of static patterns that could have occurred—and easily explained as the outcome of the ordinary operation of the laws of physics.) Rather, the claim is that the best explanation for the fact that many living systems exhibit specified complexity—the kind of complexity that neither chance nor necessity can plausibly produce—is that those systems are the product of intelligent design.

Theory of Information

One helpful way of fleshing out ID is as a theory of information in which complex, specified information serves as a reliable indicator of design. It is universally accepted within the scientific community that the information content found in biological systems is both readily detectable and capable of being precisely measured. Yet such information—which is ubiquitous in Earth's biosphere—clearly is not reducible to the matter in which it is embodied. For example, most copies of Darwin's *Origin of Species* are made of paper and ink. But surely the information conveyed by any particular hard copy of this work is not reducible to its constituent physical parts. The information instantiated in (and transmitted by) a book's pages is of a different order, metaphysically speaking, than the pages themselves. This is seen most obviously in the fact that information has to be correctly interpreted in order to be understood and properly applied. Take, for instance, the "round dance" of the honeybee. This entomological pattern of movement communicates complex, specified information to other honeybees in the group, which in turn are able to correctly interpret that information (which informs them of the location of nearby food sources) and act upon it in ways that are conducive to the continued flourishing of the hive. This fascinating phenomenon raises a number of interesting questions: where did the dancing honeybee come up with the idea of such a communication in the first place? And how do the other bees know what the dance *means*? Why don't they view the dance as a lecture on honey production or as sheer entertainment rather than interpreting it correctly? Indeed, why do the bees take the dance to signify anything at all? This display of significant information content

embodied in a primitive language bespeaks intelligent design, since no purely materialistic explanation of the round dance can plausibly account for the origin and orderly flow of the information it exhibits.

Ten Common Objections to Intelligent Design

(1) *ID is just another species of Biblical Creationism.*

It is striking how frequently this claim is made in anti-ID literature despite being demonstrably false. Indeed, it should be obvious from what has been discussed thus far that such is not the case. Of course it is true that ID is *consistent* with Biblical Creationism, but it is also consistent with Islamic Creationism, theistic Hinduism, Confucianism, deism, the creation stories of numerous indigenous tribal religions, and the belief that extraterrestrials seeded the primordial earth in order to produce the diversity of life forms we see today. Nothing about ID presupposes, implies, or relies upon a belief in the divine authority of the Bible or Christian doctrine. In fact, considered in itself, ID doesn't even take issue with the chief tenets of Darwinian evolutionary theory, including Common Descent. ID, then, should not be confused or conflated with Biblical Creationism.

(2) *ID is pseudo-science.*

This allegation is rhetorically tendentious and amounts to little more than blustering bravado. Many such objectors stack the deck against ID by conveniently defining science in such a way as to simply dismiss ID (on the grounds that it isn't scientific) without seriously considering its merits. The fact of the matter is that ID *is* a scientific theory (albeit limited in scope) involving testable, empirical claims about particular features of the natural world. In fact, the empirical methods proposed by ID theory aren't fundamentally different from the techniques of design detection routinely employed by casino management, medical forensics, and NASA's SETI program. Moreover, even if it is granted (for the sake of argument) that ID isn't, strictly speaking, "scientific," it doesn't logically follow that ID is *un*scientific. Many intellectual endeavors, such as natural theology, cultural anthropology, physical geography, and art history aren't scientific in the same sense as biology, yet none of them are repudiated for such a reason. Clearly, then, ID is not scientific quackery.

(3) *ID isn't scientific because it makes no predictions.*

In one sense this contention is true, yet unproblematic; in another sense it is false. It is true in the sense that most serious, well-informed ID hypotheses go hand-in-hand with the empirical findings of modern biology and thus do not generate highly-specific or novel predictions. This is because, as was mentioned earlier, there is no incongruity between ID and the fundamental empirical claims of Darwinism (though of course 'Darwinism' has to be carefully defined here); the real incompatibility is that between ID and the union of metaphysical materialism with Darwinian evolutionary theory. It should be no surprise, then, that the majority of the leading proponents of ID don't take issue with most of the reported findings of modern evolutionary biology but rather reject the underlying materialism that is unjustifiably presupposed by some evolutionary biologists (along with certain questionable interpretations of the scientific data that

are clearly driven by philosophical, rather than strictly empirical, considerations). However, the assertion that ID doesn't make predictions—and thus isn't scientific—is false in another sense. ID does make a number of general predictions, such as the prediction that irreducibly complex mechanisms and instances of specified complexity will be relatively abundant in nature and the prediction that scientists can discover the basic design plan of a biological system by doing a reverse-engineering analysis of that system. It is probably most accurate to say that although ID delivers little in the way of fresh or innovative predictions, it nevertheless demonstrates remarkable explanatory scope and power (inasmuch as many and diverse phenomena are best explained by it).

(4) *ID isn't scientific because it isn't falsifiable or subject to disconfirmation.*

To the contrary, ID *is* falsifiable: if the objector can provide a better explanation for any purported instance of irreducible or specified complexity, then to that degree ID has suffered disconfirmation. It is important to note, however, that in order to be a genuinely better explanation the alternative offered must be strongly warranted on the basis of the relevant evidence (and hence not be endorsed on the grounds that the philosophical presuppositions of its advocates render it more likely than its competitors). One of the ironies of this criticism of ID is that it is materialistic Darwinism which often seeks to render itself immune to falsification by invoking the allegedly indisputable procedures of extreme methodological naturalism (see below). So while ID theory willingly subjects itself to rigorous attempts at falsification, materialistic Darwinism is adamant in its insistence that material causes *must* be sufficient to explain all biological complexity and thus unfairly resists falsification (since it rules out design inferences *a priori*). This latter observation is not surprising when one reflects upon the fact that within the confines of a materialist worldview, the spontaneous generation of life and subsequent unsupervised evolution is the only game in town. Materialistic Darwinism neatly dismisses competing theories out of hand, an epistemic luxury that cannot be had by *bona fide* empirical science.

(5) *ID isn't scientific because it appeals to supernatural causes and thus violates a core principle of methodological naturalism.*

Two replies are in order here. First, ID as such does not appeal to supernatural causes; it merely maintains that certain features of the natural world are best understood as being the product of intelligent design. (Whether this intelligent designer—or designers—is a supernatural entity is a different matter.) Second, this objection assumes that methodological naturalism (understood as a firm denial that supernatural phenomena can be the subject of empirical investigation) is an essential component of authentic science. As noted earlier, Dembski's Explanatory Filter actually employs a moderate form of methodological naturalism inasmuch as it does not allow for a design inference until all non-teleological explanatory resources have been exhausted. Yet it is highly disputable whether a more stringent form of methodological naturalism ought to be considered normative for the practice of the natural sciences. Unfortunately, in some quarters of the scientific community an extreme type of methodological naturalism functions as a rigid, provincial, and intolerant philosophy of science. In its most dogmatic forms, methodological naturalism is functionally indistinguishable from metaphysical naturalism, since it precludes supernatural (or even non-materialistic) causes from consideration at the outset of scientific

inquiry, rather than allowing scientists to reason to the best explanation (on the basis of the pertinent data) and let the chips fall where they may.

(6) *ID isn't scientific because it is a God-of-the-gaps theory.*

Here the contention is that ID is an argument from ignorance. The objector alleges that proponents of ID abandon the attempt to find undirected causes of biological complexity too soon, copping out by resorting to "we can't figure out how this system came to be so God must have done it" as a pseudo-explanation. However, this is not an accurate portrayal of how ID operates. As explained above, the Explanatory Filter serves to demonstrate that in some cases it is so highly improbable that solely material and unguided causes produced a particular biological phenomenon that a design inference is rationally justified as the best explanation for the complexity exhibited by that phenomenon. Moreover, although surely God is the primary candidate for the origin of complexity in nature, a design inference in itself does not entail that God is the one who "filled the gaps" left by chance and necessity. It is evident that one need not know precisely *how* (or by whom) an instance of irreducible or specified complexity came to be in order to know *that* the phenomenon in question displays such complexity. To see this, an analogy from evolutionary biology may be helpful. In a number of cases there is very strong genetic evidence of an evolutionary sequence from creature A to creature B despite scientists' ignorance regarding precisely what factors drove the transitional evolutionary process. But what is good for the goose is good for the gander: if materialistic Darwinists are allowed to cite mechanism-independent evidence for the theory of Common Descent, then it's nothing short of *chutzpah* for them to insist that advocates of ID be able to detail the precise way in which the designer of a biological system put it together. And the double-standard doesn't end there: Darwinists of a materialist bent frequently employ highly-speculative Naturalism-of-the gaps arguments ("we can't figure out how this system came to be so Nature must have done it") when faced with especially recalcitrant instances of irreducible and specified complexity. So the God-of-the-gaps charge doesn't stick.

(7) *ID fails because it is possible that apparent design is the result of materialistic processes.*

This objection is rather feeble: it is analogous to stating that materialistic Darwinism fails because it is possible that apparently non-fabricated biological systems are the product of purpose-driven processes. Surely the mere possibility that a contrary hypothesis is true doesn't provide sufficient grounds for rejecting an ID hypothesis; instead, the contrary view must be demonstrably more probable than its competitor. The natural sciences operate on the understanding that a hypothesis ought to be provisionally accepted if it is the best explanation for a given set of data. The fact that materialistic Darwinism offers a conceivable alternative hypothesis to ID does nothing to undermine the basic conceptual and empirical integrity of ID. Moreover, even if an allegedly designed biological system was later shown to be better explained as the result of chance and necessity, such a discovery would only disconfirm that particular design hypothesis; ID theory as a whole would not thereby be falsified. Conversely, materialistic Darwinism is falsified *in toto* if even one actual instance of biological design can be legitimately confirmed.

(8) *ID fails because its proponents can't agree on the identity of the designer.*

Actually, it is this objection which fails on two counts. One, it is a red herring. Archaeologists routinely (and rightly) conclude that the ancient artifacts they unearth are the product of intelligent design even if they are unable to determine which tribe made the relics in question. Why, then, should ID theorists have to identify the being who designed a given biological system in order to make the bare assertion that the system in question is designed? Two, the objection ignores the critical distinction between ID *proper* (the basic claim that certain living organisms exhibit the distinctive marks of intelligent design) and various *kinds* of ID (that is, ID in the service of a particular theology, whether it be Christian, Jewish, Sikh, Shinto, Yoruba, Apache, or whatever). Advocates of ID proper readily acknowledge that only a very modest number of attributes and intentions of the designer can be inferred from the things he has designed. Furthermore, credible defenders of ID will concede that any ID theory of a specifically religious sort would have a much lower initial probability (due to its higher information content) and would be much more easily subject to falsification (due to the greater number and specificity of falsifiable predictions it would generate). Thus the inability of ID proper to name the designer of an engineered system has no bearing on its success or failure as a theory.

(9) *ID fails because there are examples of suboptimal biological design.*

Au contraire; the purportedly suboptimal design found in some natural systems is irrelevant to the success or failure of ID proper. Take, for example, a poorly-designed stapler that often fails to eject a staple from its cartridge even when the top part of the stapler is pressed down quickly and firmly. Although the frustrated office worker attempting to use this device to staple together the pages of a report would rightly deem it to be a piece of inferior workmanship, no one would take him seriously if he suggested that therefore the various parts of the stapler must have been formed and assembled solely as the result of the laws of physics acting on primitive earth materials. In the same way, the seemingly less-than-ideal design of some biological mechanisms in no way counts against the reasonableness of the claim that such mechanisms are the product of intelligent design. "Playing the suboptimality card" might work as a rebuttal to specific, religious kinds of ID—say, Perfectionist Theism, in which God makes nothing but the very best—but doesn't serve to refute the much more modest claim that certain biological systems display reliable indicators of intelligent design. As far as ID proper is concerned, the alleged suboptimal work might have been done by a committee of junior deities (as proposed by British philosopher David Hume in his *Dialogues Concerning Natural Religion*), the god of Process Theism (encumbered as he is with an unfortunate learning curve), or even space aliens (as proposed by molecular biologist Francis Crick in his doctrine of Panspermia). The burden of explaining why a benevolent, omnipotent, all-wise God would create suboptimal systems (or allow for originally optimal systems to degenerate over time) is the task of scriptural and philosophical theologians of various religious traditions, not scientists who adhere to ID proper.

(10) *ID fails because there are examples of malevolent biological design.*

This, too, is a *non sequitur*. The theoretical soundness of ID proper is logically independent of the moral qualities of the biological mechanisms at issue. Whether the objector has in mind the miniature, hypodermic needle-like mouthparts of mosquitoes which aid in the proliferation of fatal diseases, the deadly venom-injection mechanisms of many species of snakes and spiders,

the horrific ravages of the ebola virus on the human body, the lethal (and sometimes gratuitous) savagery of big cats such as the African lion, or any of numerous additional examples, the fact remains that the "sinister" devices used by creatures that cause pain and suffering are still clearly *designed*. Admittedly, such instruments of natural evil may pose a problem for ID in the service of certain worldviews; in fact, they may turn out to be strong defeaters for warranted belief in any number of theologies. On the other hand, the existence of evil in nature may actually serve to strengthen the claims of some religions, even corroborating key tenets. For example, a wicked creator god is proposed in Gnosticism. Zoroastrianism features a destructive god named Angra Mainyu who seeks to wreak havoc in the world. On some Pentecostal theodicies, the Devil had a hand in tampering with God's creation before Adam and Eve were made. In any case, the observation that there exist biological apparatuses which produce seemingly unnecessary misery among the sentient creatures of our planet is no threat at all to ID proper, as long as it can be shown that the system in question exhibits the characteristic features of intelligent design. Thus the problem of natural evil cannot legitimately be used as a basis for undercutting the rational justification of design hypotheses.

Conclusion

It is credible, then, to maintain that the existence of intelligent design in nature can be established on scientific grounds. However, ID theory falls short of definitively identifying the designer, since the immediate scope of its investigation is limited to objects in the natural world (specifically some of their information-bearing properties). Although an expanded ID theory may someday provide ample reasons for predicating uniquely-identifying traits of this designing intelligence, ID proper (that is, ID apart from any supplementary theological data) significantly limits that which can be known about the designer (or designers) of Earth's biological systems. Interestingly, the Bible, too, testifies to the fact that apart from divine revelation, human beings are able to know only a few very basic attributes of God (Matthew 11:27; Acts 17:22-23; Romans 1:19-20). Although most people intuitively understand that God is the Creator and Sustainer of the world and its creatures (Genesis 1:1; Psalm 104), relatively few acknowledge that this divine being is to be identified with the Lord Jesus Christ (John 1:1-3; Colossians 1:15-17; Hebrews 1:2-3). My hope is that if you have been convinced that intelligent design is a reality to be reckoned with, then you will go on to seek to discover the identity of the One who made you (Genesis 1:26-27; Psalm 139:13-16). For the God of nature is not just an intelligent designer but a righteous, loving, and gracious Redeemer (Psalm 78:35; Isaiah 48:17) in whom alone is found salvation from sin and the gift of eternal life (Matthew 1:21; John 17:3).