The Intelligent Design Movement
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Introduction

The slogan 'Intelligent Design' came to prominence in the 1990s starting with the work of P. E. Johnson and his book *Darwin on Trial*.[1] This was built upon by the biochemist M. Behe in his book *Darwin's Black Box* in 1996. Several like-minded scholars got together and decided to promote the idea of intelligent design and, hence, critics refer to an 'intelligent design movement'. A research institute—the Discovery Institute—was set up and two philosophers of Science joined the cause—W. A. Dembski and S. C. Meyer.[2] The movement gained notice and apologists for evolution responded with criticism, scientists such as K. R. Miller, in *Finding Darwin's God*,[3] F. J. Ayala and J. A. Coyne. Other philosophers, not particularly identified with the movement, have added critical observations about aspects of Neo-Darwinism such as A. Plantinga, J. Fodor and T. Nagel. In turn, philosophers supportive of evolution have written defences, such as M. Ruse and R. T. Pennock.

The intelligent design movement seeks to disconnect a metaphysical naturalism from the day-to-day practices of Science. If intelligent design is to be admitted to the range of scientific hypotheses, this disconnection is essential. Advocates of ID disassociate themselves from religious creationism. They are not in the business of defending the Bible. They are merely arguing that we can make an **inference** from complexity in nature to an intelligent cause.

Philosophically, the 'intelligent design' argument can be made into the traditional 'Design Argument for the Existence of God'. Intelligent agency is a known and common cause for complex coded information and complex functional systems, including those constructed by us in biology laboratories. It is reasonable therefore to infer an intelligent cause (God) for at least some specified complexity, and particularly irreducible complexity, in nature. Regardless of this use of the 'intelligent design' argument, however, ID theorists see our awareness of the increasing complexity of nature as the driver for a move away from naturalism to intelligent causation—and this is the significant claim—not any argument for God's existence.

It is often said that ID is not a 'scientific' hypothesis; it does not generate predictions; and it is not open to confirmation or falsification. Formally, an inference of design is predicated upon a previously specified criterion being satisfied (or not). The scientific credentials of ID rest upon whether such a criterion is scientific. We might well suspect that such a criterion is an inherently philosophical device. Whether this is 'science' or 'philosophy' is a bit of a moot point for us; our interest is the logic: can we specify and justify a criterion of design in the first place, the application of which will identify design in nature?

The Design (or Teleological) Argument for the existence of God usually does two things: First, it argues from complex order and regularity in nature to a conclusion of design; it does this on the basis of an **analogy** (a comparison) with the complex order and regularity of human artifice (e.g. machines) and the fact of their having been designed. Secondly, it then observes that these designs in nature are comprised of interdependent parts that express means-ends relations that have purpose(s) for a whole; on the basis of the analogy with human artifice (e.g. machines) that has similar means and ends that have purpose(s), it infers the existence of a corresponding Designer.[4] What the second step adds is a notion of 'function' or 'utility' to the argument; the argument is not just about the *bare existence* of complex order and regularity. We will be concerned principally with the first step; the two steps together constitute the 'full' form of the Design Argument.

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[1] P. E. Johnson was a professor of Law at the University of California, Berkley.

[2] For a history of the movement see A. Menuge, "Who's Afraid of ID? A Survey of the Intelligence Design Movement" in *Debating Design* (eds. W. A. Dembski and M. Ruse; Paperback edition; Cambridge: Cambridge University Press, 2007), 32-51.

[3] K. R. Miller, *Finding Darwin's God* (New York: Harper Perennial, 2007); the original edition was published in 1999.

[4] P. Frank, "On the Assumption of Design" *Theology and Science* 2/1 (2004): 109-130 (109); T. McPherson, *The Argument from Design* (London: Macmillan, 1972), 1-13.

In this essay we are not seeking to disprove natural selection, or the common descent of species; you do not need to rule out evolutionary explanations to establish the case for purposeful design. When considering the Design Argument with reference to biological organisms the only relevant issues are whether intelligence can be inferred from the existence and nature of biological complexity[5] as a causal factor and whether it is reasonable and persuasive to compare 'design' in nature to the human capacity for design.

Design is a broad concept. We are familiar with the design process, but this is different from the *making* process. If we can infer design from biological complexity, or if we compare design in nature with human design, this in itself says nothing about the *making* processes that have been employed by any divine intelligence.[6] The full notion of 'design' above refers to an intention behind something, not the process by which it came into being. What we propose as a corresponding process to intelligent design could include 'selection' as well as 'forming', 'making', 'co-ordinating', 'initiating', *and so on*. It is sufficient for the full form of the Design Argument to demonstrate that an order, pattern or regularity **could** be intentional for it to form part of the grounds for saying that there is a Designer. The Design Argument does not, of itself, furnish the full concept of God but, inasmuch as it points towards an intelligent agent, it is a powerful argument in favour of God's existence.

The Design Argument is not an argument for a Divine Maker/Craftsman. The argument is not saying that things look *made* and so there is a Divine Maker. For example, someone might argue that if a thing has a function, then it has been made, and this is just as true for nature as it is for human artefacts. The Design Argument doesn't revolve around the link between function and *crafting* that function.[7] Rather, the argument is about the *look of design* and thereafter it is adapted to concern what looks made to us as makers.

The focus of this essay then is upon the explanatory adequacy of purely naturalistic means of change. It is not trying to replace natural selection everywhere; it is attempting to place 'intelligent design' alongside natural selection as a more appropriate explanation of some (even many) kinds of complexity. We are concerned with the notion of design in nature: apparent and intelligent. We are interested in challenging the idea that there is an 'either/or' here: why can't there be both intelligent design and apparent design, with each being judged on a balance of argument for any given case?

Apparent Design
The alternative to that of purposeful design is the notion of apparent design. When describing nature purely in evolutionary terms, we cannot talk of design but only *apparent* design. We cannot attribute intentionality to 'nature' on a materialist world-view, except in a figurative way, and if we do this, we beg the question as to why we feel the *need* to speak figuratively.[8] Does this show that we intuitively feel that nature requires a spiritual explanation—that ultimately we need to ground our explanation of nature in God?

The notion of 'apparent design' opposes that of 'intelligent design'. The claim is that there is in nature a capability for spontaneous change in organic entities; such changes are selected or deselected environmentally and those that survive in descendants contribute to an appearance of being designed for a given environment by dint of the fact that the changes are environmentally selected.

The theoretical elements here are,

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[5] The Design Argument can use data from various sciences but in this essay we are restricting our attention to Biology.

[6] The presumption here is that the Design Argument can be used (with other arguments) to prove the existence of a single divine intelligence; on this see A. Kenny, *The Five Ways* (London: Routledge & Kegan Paul, 1969), 97; McPherson, *The Argument from Design*, 44.

[7] *Contra* Frank, "On the Assumption of Design", 110.

[8] A supplementary point here is that Mind is an emergent property of some complex organisms—see P. M. Churchland, *Matter and Consciousness* (rev. ed.; Cambridge, MI: MIT Press, 2001). This supposition does not step out of a materialist view of things. On this view, we cannot attribute mental properties to nature as a whole as if to say that *it* is doing design.

- Multiple reproductive organic entities with a hereditary mechanism.
- Spontaneous, undirected and purposeless change.
- Natural environmental selection.
- Accumulation of adapted features.
- Correlation or fit of the entity to its environment.

The appearance of design is coming from environmental selection and in particular cumulative environmental selection. This is an important point. What we have here are two sides of a coin. The notion of design is that of a 'design for'—we often explain design in terms of function. It is a relational notion in that it requires an 'other' to explain the 'what for' element. What lies outside the organic entity and the spontaneous change of that entity is the arena in which we have to find the **apparent** 'for' element; this is the environment.

The verb 'to select' is an intentional one, a category of the Mind. The environment itself is not doing any selection—there is no action of selecting. The organic entity has a reproductive and hereditary mechanism and it is here that 'selection' is taking place in response to the environment. Changes conducive to reproduction in a given environment survive; whatever the environment happens to have been will give rise to adapted organic entities.

There is no real design here—just correlation. The real 'magic' lies in the basic fact of there just being change in the first place. It is not even *adaptive* change in the particular, since many changes may not be selected. It is just a change that at any point in time has some degree of correlation to the environment— good for reproductive survival or not so good. When we see the correlation, we make a mistake if we think of it as 'design'.

There are two variables in this equation. On the one hand there is 'life'—a changing organic entity with a reproductive and hereditary mechanism; and on the other hand, there is the passive 'environment' that acts as a determining condition for the survivability of the organic entity. Of course, the environment may be full of life, but relative to our organic unit it is a passive variable in the evolutionary analysis.

Intelligent Design
Can the notion of 'intelligent design' be integrated with the evolutionary model? It would seem that there is a place[9] for **foresight and coordination**. What happens is not all down to the organic entity; there is also the matter of the environment. If that had been different, a different result might have obtained regarding the change in the organic entity. There is therefore room here for the 'intelligent design' of environmental shaping. Likewise, with regard to the organic entity, we might have spontaneous change, undirected and purposeless, but the creationist view is that **change can also be initiated by God**.[10] There are then two avenues for integrating intelligent design into our explanation of life although neither is necessary.

There is an important distinction to be made here: whatever life there has been can be correlated to whatever environment there has been—it may be a good or bad adaptation. It follows that for any entity, for any environment, and for any correlation, there will be *some* appearance of design, good or bad. Perhaps, if things are really bad, we will readily say that there is no appearance of design; but if things are not too bad or even quite good, that appearance will be more readily affirmed. What we have here is not an argument from design, but an argument from the brute fact of adaptation. An 'adaptive' or reactive biochemistry is a baseline in biology and one way to account for this is in terms of design regardless of any particular design. The counter-observation that design is apparent obviously does not work for the observation that nature is adaptive: what would it mean to say that the adaptation is only apparent? The

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[9] *Contra* F. Ayala *Darwin's Gift to Science and Religion* (Washington, DC: Joseph Henry Press, 2007), 70, "natural selection has no foresight".

[10] The concept of 'spontaneous change' does not exclude environmental causality in the naturalistic framework and divine agency would be allied to this causality.

question therefore is whether the universality of adaptiveness suggests (on analogy) the existence of a Divine Designer.

The argument in the previous paragraph is not the full Design Argument. It is the first step in such an argument and one that is concerned with regularity in nature; it is a eutaxiological argument (Wikipedia). It is constructed around the notion of a universal property. Insofar as the argument is focused on a law-like fact of nature, it is similar to the Cosmological Argument, which reasons from 'everything has a cause' to the existence of a First Cause. Our argument has reasoned from 'all life is adaptive' to a Designer of Adaptation.

Rather than focus on regularity in nature, we are concerned with **particular** empirical evidence of complexity and order and whether this suggests design.[11] Given such design, our argument is that that there is a Divine Designer because this kind of design is analogous to the design capabilities of humans.

Dembski notes that,

> The design inferred from the design inference does not logically entail an intelligent agent. The design that emerges from the design inference must not be conflated with intelligent agency.[12]

What he is doing here is restricting his concerns to the proof of design rather than going on to add a premise about human design capabilities in order to conclude that design in nature has a Divine Designer.

To affirm intelligent design is not to deny the applicability of apparent design in some cases. Rather, it is to affirm that there has been co-ordination such that certain environmental conditions *coincide* with organic changes, and to affirm that change within an organic entity has not been spontaneous but initiated. As regards scientific method, the organic change is captured in whatever description the relevant science supplies; the description of the environment in which the organic entity resides is likewise whatever the relevant science stipulates.

We are arguing for an **agent** behind the change and the co-ordination of the environment. This is not denying the reality of spontaneous change; nor is it saying that the environment may be uncoordinated. The judgment that there has been intelligence at work requires that this be possible, i.e. in creationist terms, it requires that the natural processes are such that **divine action** is possible in respect of them. Where we have an assertion of 'spontaneous change' it is obviously possible to counter-affirm 'initiated change'; where we have two elements in relation (organic entity and environment), it is obviously possible to affirm that there has been 'co-ordination' to achieve a design over and above there just being correlated change.

Randomness

Randomness is the perceived absence of **pattern or order**, for example, a random number generator program on a computer will yield random numbers. If we come to see a pattern in the results of the program, things aren't as random as we thought and we need to enhance the program. Natural selection is non-random; in an environment features are selected that contribute to survival and thus reproduction is differential. It is affirmed that what we can see in nature is a pattern of natural selection. Natural selection is then used as an explanation of 'design' in nature, i.e. we use the pattern or order to explain the 'design' and this explanation leads us to conclude that the 'design' we see is actually *apparent* because the pattern of natural selection is unintelligent.

Clearly the notions of 'pattern/order' and 'design' are close but they are not co-extensive. A knitting pattern is a design for a jumper; but not every pattern or order is a design—this is the Darwinist view. In addition, we might ask: how do we know that dis-order is not part of a design? What this question poses is: do we know the principles used in the design?

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[11] Swinburne, *The Existence of God*, 11-12, discusses Kant making the same distinction.
[12] Dembski, *The Design Inference*, 9.

This last question is useful because it helps to delimit the Design Argument. The argument is not about our knowing in advance 'the principles of design' that were used, but it is about how we make the judgment that there is a design in the first place. If dis-order is the principle of the design, then this is a Catch-22 scenario: can what is produced *show* dis-ordered design unless we already know the theory of design? Clearly not, because we will have nothing ordered to say without the theory. But what about the converse? Does the presence of order show a *fact* of design even if we cannot say what the principles of design were? Well, if we are able to say *something* ordered, even getting the principles of design wrong or putting forward competing ideas, then this shows that order is a necessary signifier of design.[13]

Returning to Darwin's challenge, how can we discriminate the two types of pattern/order (design and non-design)? One way to do this is with the notion of purpose. We might explain all the inter-dependent parts of a car but when this is done we still have to explain the car as a whole. As we drill down in reductionist explanation, we show how we can ascend the explanatory tree - but we get to a point in the climb where we started the reduction. This point also requires an explanation, but it will have to be in terms of what 'lies outside' that which we are explaining. In the case of the car, we explain it in terms of it having a purposive design for human transport.

A natural selection pattern may be non-random *in itself*, but the existence of *this* rather than *that* pattern of natural selection (viewed as a *whole*) is a matter of chance—in Darwinian terms; all we can say is that it is the pattern that has *happened* to come into existence. For a pattern that is an intelligent design (and not just an *apparent* design), this judgment is not possible: it is intelligent in itself and it has purpose as a whole.

There are two levels of analysis here that can get confused. There is a judgment about the nature of the pattern *itself*—does it imply an intelligent design? And then there is a judgment about natural selection as a whole process—do we say this was a matter of chance or part of a larger purposive design? If we made it part of an *anthropic universe*, we would be seeing it as part of a larger design. But if we explain that our universe is only one among many universes we can continue to think of any pattern of natural selection as a chance matter.[14]

A theory of Intelligent Design is about both the larger and smaller judgment: it is about the nature of the pattern in itself (Is it design?) and the existence of the pattern as a whole—is that part of a purposive design?

Seeing an intelligent design in an order or pattern in nature rather than just an apparent design **is going to be a judgment based on analogy** and our experience of making this judgment in the human sphere. The logic is not an all-or-nothing affair. It is not an argument from *any* order to design and a designer; it is an argument about this or that specific order[15] to a design and a designer. Accordingly, it has the same logic as an argument from this or that disorder to there not being any design or a designer. There is both order and disorder in the universe. Indeed, depending on our level of analysis, there is order and disorder in the same system; the design we see is not related to disorder but to a specific order at one level of analysis.[16] Furthermore, whether individuals see order or design (or not) in a machine or in nature cannot be taken for granted, but a failure in psychology doesn't invalidate the logic of the Design Argument.

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[13] *Contra* Frank, "On the Assumption of Design", 112.

[14] A principle of probability theory is that single cases cannot be made the basis of probability judgments. If there is a single universe, then a Design Argument based on its fine-tuning is not a probability argument— J. Leslie, "Modern Cosmology and the Creation of Life" in *Evolution and Creation* (ed. E. McMullin; Notre Dame: University of Notre dame Press, 1985), 91-120 (93-94).

[15] For example, if the design of the wing of aeroplane was informed by the 'design' of the wings of birds, we cannot use the design of the wing of an aeroplane as an analogy for arguing the wing of a bird was designed. This would be a circular process. Hence, the examples in nature and in the human sphere have to be unrelated; see Frank, "On the Assumption of Design", 114, 116.

[16] Frank, "On the Assumption of Design", 113, supplies examples.

Complexity

What might complexity be in a biological system? A simple way to understand the notion would be to count the number of concepts used to describe the system (or its origins). A system might be as small as a molecular 'machine' inside the nucleus of a cell or as large as a mammal.

If something is very complex, people will often express incredulity[17] that it could have come about by chance. There is a 50/50 chance of a single toss of a coin being 'heads'; but there is a 1 in 4 chance of two 'heads' coming up if we toss the coin twice. It would seem that probability is inversely proportional to complexity. But does this statistical[18] example of probability explain the intuition that people have with regard to complexity in nature when they say 'that couldn't possibly have come about by chance'?

It doesn't explain that intuition. Complexity, chance, and a low probability of occurrence, are perfectly compatible. For example, a sequence of 100 tosses of a coin has a complexity, is an ostensibly chance affair, and *any* resulting sequence has the same low probability.[19] However, if the sequence we obtained was 50 'heads' followed by 50 'tails' rather than a totally varied distribution, we would consider this to be a 'pattern' and seek an explanation over and above just 'chance'.

One way to look at the notion of pattern in relation to random data is to observe that in the sequence of 100 tosses of a coin, the number of varied distributions is far greater than the number of distributions that display a pattern. Claiming that there is a pattern is a judgment about meaning and symbolic significance; it affirms that there is information being carried by the 'object'—be this a sequence of coin tosses or a biological system. In the case of a biological system, the pattern amounts to there being an instance of design—and design is the meaning ascribed to the pattern.

Complexity therefore is not sufficient for there to be a 'pattern', but it is necessary. Further, observing a pattern in this example of the coin tosses does not alter the starting probability; rather, it sets it aside and changes *what* we have to explain. The 'intelligent design' argument is all about a kind of 'pattern' or, more technically, 'specified complexity'.

Specified Complexity

The 'Search for Extra-terrestrial Life' (SETI) listens for intelligent sequences or patterns of sound (cf. Cryptography); one sequence that the project looks for (featured in the film *Contact*) is the prime number sequence encoded in sound pulses. What the project is doing is applying a criterion to distinguish randomness from pattern, a criterion which is *specified in advance* of doing the listening and which identifies a *complexity* regarded as 'intelligent'. It is the same principle being employed in 'intelligent design' argumentation about life on earth, but in this case the data is not comprised of pulses of sound reaching us from the unknown (i.e. the minimally observable); it is data in the complexity of life, the historical development of which has not been observed. This is the argument; does it work?

Explaining or Finding Pattern

The SETI illustration (used by W. A. Dembski[20]) is inadequate. It sets up a simple scenario where what we have looks like pure randomness and we filter the incoming data against a single type of pattern for intelligence (prime numbers). Observing life on earth has not been like this: from the beginning human beings have seen patterns in nature rather than randomness.

What the SETI illustration is trying to do is persuade us that it is a reasonable method of approach to specify in advance some complex pattern and treat it as a criterion of intelligence and design. But there is a *discovery* element in SETI that is absent for the intelligent design methodology because nature is manifestly full of patterns. With nature we are trying to *explain* pattern rather than *find* pattern.

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[17] Incredulity is a human reaction, not an argument. The argument is that design has been *perceived*.

[18] S. Okasha, *Philosophy of Science: A Very Short Introduction* (Oxford: Oxford University Press, 2002), 33-39.

[19] E. Sober, "The Design Argument" in *Debating Design* (eds. W. A. Dembski and M. Ruse; Paperback edition; Cambridge: Cambridge University Press, 2007), 98-129 (108).

[20] W. A. Dembski, "The Logical Underpinnings of Intelligent Design" in *Debating Design* (eds. W. A. Dembski and M. Ruse; Paperback edition; Cambridge: Cambridge University Press, 2007), 311-330 (319).

The dispute between intelligent design and natural selection is not about finding pattern but about explaining or accounting for pattern. In the case of life on earth, we have **two disparate and competing pattern explanations**. Of course, you could say that intelligent design is about finding a certain *type* of pattern just as SETI is about trying to find a type of pattern. But this reply is weak: the SETI and intelligent design methodologies are different because intelligence and natural selection are *competing* as explanations. Complex patterns are accounted for in terms of natural selection and so the logic is one of *bringing theory to pattern*. This logic is different to that of SETI which is about identifying a pattern in the first place.

Independent Specification
Specified complexity can function as a criterion for detecting design, and it does so, for example, in forensic science, where we can test and modify the criterion appropriately. Typically, we are trying to discern intelligence in the evidence to determine if we have, say, a murder or arson. With forensic science, we use our knowledge of what has previously displayed evidence of intelligence in patterns of evidence—in our old cases. We bring this to the new and unknown situation to determine if there has been intelligence at work. But the 'history' that we are after in the biological sciences is not amenable to such a criterion because we can't *independently* specify the complexity that will identify intelligent design.

In SETI research we may apply multiple filters to the raw data, i.e. consider multiple number patterns as indicative of intelligence. We specify in advance what pattern we are looking for in the data. The data could exhibit one pattern and not another. The crucial difference with the ID method is that the Number Theory involved in SETI has an epistemic independence in respect of the procedure.

There is a difference here but it is one that is ironic. A biblical intelligent design method might have delivered a pattern that was independent and specified in advance in virtue of it having been given through revelation. Just like the SETI example, where we have an independent body of knowledge in Number Theory which we then apply to the raw data of radio pulses from space, 'Revelation' (not the book) is an independent body of knowledge which we can apply to the raw data of nature. However, there isn't a 'biblical intelligent design method' because we don't have any usable specifications of complexity.

Order of Complexity
Intelligent Design theorists talk of probabilities in relation to the complexity they identify in nature. If we specified a compositional, functional or developmental pattern in advance as a criterion of design, the terms of reference would be inherently biological (taken from observation) and thus beg the question.[21] But if we use the **statistical probability** of some biological pattern being a matter of chance as an excluding criterion in favour of design, we will have a non-biological independence; this is not a pattern as such but only an aspect of a pattern, namely, its probability.

There is another problem with this strategy. Dembski argues that if we eliminate chance and the laws of nature as explanations of a pattern, then design is the best explanation: "to attribute an event to design is to say that it cannot reasonably be referred to either regularity or chance".[22] There is a 'context of interpretation' here and for certain types of complexity it is not nature. It is a third undeveloped context dubbed 'design'. This doesn't give a positive characterization of what design *is*—whereas we have suggested that design is an aspect of the meaning of an object.

Intelligent Design theorists want to bring a pattern to the raw data of biological systems, one that is specified in advance, and a pattern that has a low probability of occurrence. It is not clear that we can as yet do this because we have no way to calculate the probability of a developmental sequence that has occurred in nature (we don't know enough to specify the sequence).[23] Maybe we can do this for different controlled conditions in the laboratory, but this would defeat the purpose of the 'intelligent design' argument. It seems

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[21] That is, we might be able to construct a criterion to detect (or infer) design but we would probably be loading the dice in our favour using our knowledge of nature.

[22] Dembski, *The Design Inference*, 36.

[23] Suppose that there has only been enough time for 100 changes in the history of life on earth and we have what we can see around us. The either/or probability of any sequence would be the same regardless of what we see around us. However, this supposition is not about specifying a pattern in advance.

then that intelligent design is a theory that is *applied* to what is already seen as a complex pattern. (The same point would apply to natural selection if it was a pattern specified in advance.)

Summary
The positive contribution of the 'intelligent design' argument is to make the notion of 'pattern' clearer and more distinguished. Beyond mere complexity and a low probability of occurrence, we 'see' patterns in nature. The difficulty for this 'intelligent design' argument is actually specifying a pattern in advance that will detect design as opposed to chance. Our conclusion is that a pattern *could* be indicative of intelligent design and/or natural selection. But there doesn't seem to be a way to specify in advance a complexity that we can use to discriminate the two possibilities.

Irreducible Complexity
Is there a kind of complexity that excludes natural selection as the reason for a pattern for a given biological entity? Other 'Intelligent Design' theorists (Behe[24]) say that this is 'irreducible complexity'. Their proposal is that there is a kind of complexity that is so tightly interdependent its parts have no functionality aside from contributing to the functionality of the whole. In Dembski's terms, this specifies a complexity that is a marker of design.[25]

The significance of this kind of complexity is that it calls into question the adequacy of natural selection as the mechanism of development for a biological life-form. The problem posed for natural selection is that there is no gradual evolution of the function of an irreducible complex system; the system doesn't have its function until all the parts are in place. The 'environment' is not building or improving an irreducibly complex functionality in steps; it doesn't have an obvious selective role in relation to the parts as they have evolved towards the eventual whole.[26]

For example,[27] the bacterial flagellum is a complex biochemical system—a kind of 'motor' that enables a bacterium to move through its watery environment—that requires the interaction of about forty proteins to achieve motor function. The complexity lies not only in the biochemistry of its parts but in the motor control information systems of those parts. Such a system looks designed because it is irreducibly complex, i.e. we cannot analyse its environment and identify the necessary selective import affecting the assembly of the parts.

The argument is not rejecting natural processes as the mechanism for bringing about an irreducibly complex structure; it is just rejecting *natural selection* as the process and bringing intelligent control to whatever process is hypothesized.

Dembski notes that "there are plenty of complex biological systems for which no biologist can claim to have a clue how they emerged. I'm not talking about hand-waving just-so stories. Biologists have plenty of those. I'm talking about detailed, testable accounts of how such systems could have emerged".[28] He argues that natural selection can only select for pre-existing functions like adapting finch beaks to handle stronger nuts or a change of diet from nuts to insects (or varying the colour of snail shells, etc.). The parts of the

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[24] M. Behe, "Irreducible Complexity: Obstacle to Darwinian Evolution" in *Debating Design* (eds. W. A. Dembski and M. Ruse; Paperback edition; Cambridge: Cambridge University Press, 2007), 352-370.
[25] The notion of 'irreducible complexity' is not original to the ID movement; it is clearly present in the work of Paley; see F. Ayala, "Intelligent Design: The original Version" *Theology and Science* 1/1 (2003): 9-32 (13).
[26] The immediate problem with the argument is that there is no 'as they have evolved towards' burden to satisfy for natural selection; it doesn't have a 'purpose-direction of travel' element. This allows us to ask, in turn, as to whether we see a direction in the history and how we account for that direction. This question mimics the question of design and the classic formulation is F. R. Tennant, "Cosmic Teleology" in *The Existence of God* (ed. J. Hick; Collier Macmillan Publishers, 1964), 122-136.
[27] Another common example is the human eye. In the hypothetical development of the eye, at any earlier stage of development (say 5%) we don't necessarily have a useful amount of vision (say 5%); it depends on what has developed; A. Plantinga, *Where the Conflict Really Lies*, (Oxford: Oxford University Press, 2012), 18.
[28] Dembski, "The Logical Underpinnings of Intelligent design", 323-324.

bacterial flagellum have **no possible function** other than what we know to be their contribution to the working whole as we see it now.

There is a question here of 'where you make your stand'. Where do you make the design inference? If we describe the bacterial flagellum as irreducible complex, making this kind of complexity a marker of design, we make this level in a biological hierarchy the basis of a design inference. This begs the question of why we are not doing this for the proteins that make up the flagellum. The point is that we might also infer design for a protein (or we might not). The argument from irreducible complexity is not a general Design Argument implicating design everywhere. The point is to produce biological examples that are better explained (or only explained) by intelligent design rather than as an apparent design.

The main weakness in the 'intelligent design' argument is the phrase 'no possible function' (above). What if there were functions that were attributable to the parts the evidence for which is no longer present? The whole is now irreducibly complex but there were separate and different functions performed in the 'original' state of the parts and during their coming together to form the whole.[29] For example, stones taken from a wall to make an arch would now form an irreducibly complex structure but the scaffolding used to construct it would no longer be present or the wall.[30]

The counter-claim is that natural selection can only choose systems that are working. Until the flagellum is functional, it cannot be developed by natural selection. Prior to it working as a motor (prior to it *being* a motor), natural selection must have been working with *other* functionality in relation to the proteins. If we can find similar proteins (or the same ones) with other functions (in different biological systems), this is evidence that the proteins in the flagellum could have had different prior functionality.

For example, K. R. Miller puts forward the similar Type III Secretory proteins as illustrations of different functionality that might have occurred in the development of the flagellum.[31] However, his treatment only serves to show to the general reader how little is known (or has yet been offered) about the development of the flagellum. The Type III Secretory System is itself irreducibly complex, but this does not make Miller's point invalid. He is merely showing that the correct response to a claim of irreducible complexity is to make a reduction in one of the elements; the reduction itself might be irreducibly complex. The counter-argument is to hypothesize other functions for the parts and a functional history.

There is a **stand-off** in argument in this reply. The problem for the evolutionist is the hypothetical imagining of the 'back-story' to the irreducible complexity that we see now. There are a lot of irreducibly complex biological systems 'out there', so the work of imagining is not small. Let us assume that this can be done; what we really need is a *test* to determine whether what is imagined *probably took place*.[32]

Natural selection is an easy story to tell for the large-scale environment that we see around us and in the laboratory. It seems less easy in molecular biology which is where intelligent design theorists have drawn their examples. This is compounded by the requirement that it is the historical 'molecular environment' that is under scrutiny. It seems that any 'historical science' in this area is going to be irreducibly hypothetical.

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[29] What we need are "detailed models for intermediates in the development of complex biomolecular structures", M. Behe, "Molecular Machines", in *Intelligent Design Creationism and its Critics* (ed. R. T. Pennock; Cambridge, MT: MIT Press, 2001), 241-256 (253).

[30] R. Dawkins, *The God Delusion* (London: Black Swan, 2007), 156; Dawkins use of the analogy is colourful. See also P. Kitcher, "Born-Again Creationism" in in *Intelligent Design Creationism and its Critics* (ed. R. T. Pennock; Cambridge, MT: MIT Press, 2001), 257-287 (263-264).

[31] K. R. Miller, "The Flagellum Unspun: The Collapse of 'Irreducible Complexity'" in in *Debating Design* (eds. W. A. Dembski and M. Ruse; Paperback edition; Cambridge: Cambridge University Press, 2007), 81-97 (86).

[32] This point can be misunderstood. An irreducible complexity observed *now* cannot be a proof of the impossibility of it having developed in a gradual way. Further, we cannot argue that biologists will not hypothesize plausible developmental pathways as biochemistry advances. The point is that when this is all done, we will want a *test* to decide if what is imagined probably took place; Kitcher, "Born-Again Creationism" 264, shows why the rhetoric of Behe needs this two-step correction.

Is it fair then to infer from an irreducible complexity *now* to intelligent design as the cause? The **analogy** is that this is our experience of accounting for such complexity: for instance, an engineer brings (even co-opts) functional parts to produce an irreducible and newly functional whole. So, we have here a sort of induction: from our common experience of accounting for irreducible complexity with intelligent design in various fields, we can legitimately apply the same inference in Biology.

We have said above that there is a 'stand-off' in argument between intelligent design theorists and evolutionists. This is because they are both doing philosophy with the data. Inferring intelligent design from irreducible complexity is the beginning of a philosophical account of what we might mean by 'intelligent design'. This could be worked out in terms of Theism, Deism or Idealism (and no doubt other 'isms'). Equally, continuing to look for an explanation of 'irreducible' complexity and providing reductions that explain the development of the parts goes hand-in-hand with a materialistic outlook.

There is more to the stalemate; it isn't just a question of what to do with minute complexity—taking the attitude that with our having little, as yet, scientific explanation of a molecular machine, let's invoke design. Rather, for a creationist, intelligent design, as a hypothesis, is putting *agency* at the heart of physical processes and this is philosophically problematic in the same way and for the same reasons as the relationship between Mind and Body is problematic.

In the case of other minds, we make inferences from bodily observations to mental causation all the time. With animals we make similar anthropomorphic judgments. We determine that something has been made, like a watch found on a path, and we infer a maker even though we have no first-hand knowledge of the watch having been made. There doesn't seem to be anything irrational or unreasonable in inferring design from complexity in nature. It just seems to be that the inference is not a deduction and it is not the only possible explanation.

The reason why intelligent design and natural selection compete as explanations is that the intelligence we infer for humans and animals is part of our world whereas the intelligence we are inferring in intelligent design isn't obviously part of our world, or in the case of God, positively placed outside our world. Understanding ourselves, our behaviour and its effects, is the basis upon which we ascribe intelligence where we see others, their behaviour and any similar effects.

We understand the processes through which things are made by us—the use of hands, instruments and tools, and raw materials, etc. We lack this framework for situating an inference of intelligent design. Even if genetic engineering and our abilities to make biological systems become ever more sophisticated, this won't give us a framework in which to situate an inference of intelligent design because the intelligence being proposed is not ours (it is not 'of us').

Most people think of the intelligence in the 'intelligent design' argument as God,[33] but the argument is usually presented in neutral terms so as to have no implications about the nature of the intelligence. Whether we think of the intelligence as external to biological systems or internal to the system of life in the universe as a whole, there is going to be a Mind-Body distinction. At this point, the issue is very philosophical, but my point is that the 'intelligent design' argument is an expression of the philosophical system of Dualism whereas natural selection is an expression of the philosophical system of Materialism.

There aren't many scientists working to produce science based around intelligent design, and it would be surprising if there were, since the creationist's **concept of agency** makes no contribution to the project of describing physical processes.[34] A description of a process that invokes agency can always be reduced to just a process description, but this doesn't make that choice exclusive. Essentially, natural selection

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[33] Scripture doesn't have an argument based on irreducible complexity, just the claim that things are wonderfully made, which is more about co-ordinated complexity.

[34] This is not saying that the point in space-time of an observer does not affect certain categories of observation; see Sober, "The Design Argument", 116.

functions as a natural and metaphorical 'agent' and so is the explanatory equivalent to Mind for the materialist world-view. (The verb 'to select' is a metaphor of agency.)

Our conclusion then is that if Science is about Body and Process, rather than Mind, if Science is only about materialist accounts of nature, then intelligent design is not a scientific inference. Rather, it is an inference to Mind and suggests a Dualism that cannot be reduced to materialist categories. On this analysis there is a kind of philosophical **parity** between natural selection and intelligent design: they are equally philosophical choices.

Probabilistic Argument

Probability[35] is often used to arbitrate between design and no-design. Intuitively, we might think that we can 'count the present' but we cannot 'count the past'. For example, we can count base pair sequences now but we cannot count the number of evolutionary steps (if any) taken to bring about a genome. On the other hand, people will often say, subjectively, something like, 'The chance of that happening is too high; I don't believe it happened by chance', which is a way of putting a number on the past.

With biological systems, we can apply a count. For example, we could count the proteins in the bacterial flagellum and treat them as a sequence. Giving a neutral 50/50 chance of occurrence to each protein,[36] we could compute a probability that the sequence would have been assembled in the right order. It would be very low and persuade us that it couldn't have happened by chance. However, Miller notes that this treats the flagellum as a 'discrete combinatory object'.[37] Nature is not a matter of such blind combination. In 100 tosses of a coin, each toss is equal to another in effect—but this is a discrete and uniform mode of change.[38] Darwinian change is not like this; it is about selecting for the good and adding to that change.

P. Kitcher makes two obvious points that weaken the appeal to probability.[39] First, a probability value about the future does not tell us that the sequence did not come about first (we might add: 'or soon thereafter'), i.e. a probability value about the *future* does not tell us about the *past*. For example, he says that the probability of dealing a certain bridge hand sequence of 13 cards is 1 in 4 x 10^{21}, but this value does not tell us *when* that card sequence will be dealt and in nature we already have what has been dealt.

The second point is about tolerance and how many ways there are to get a job done at the biochemical level. We cannot assume that there is only one way – one sequence – of proteins that will achieve a task. The probability of the sequence we actually have having come about may be entirely misleading if we are evaluating a complex function. The probability of a particular sequence that does the job coming about is lower than the probability of one of several sequences that could do the job coming about. The point here is: in assessing evolution, why should we focus on the particular rather than the general in our assignment of probability values?

In addition, there is a deficit in the counting of a complexity that exists now and taking this as a criterion for design. This deficit is the need to show the *relevance* of such a count, when the information we seek is historical and developmental. A probability calculated on a sequence coming about with each element of the sequence having a neutral chance of occurrence is an artificial exercise: we don't know the number of changes that were taken in the development of a sequence. (Obviously, we can compute the probabilities for what we construct in a laboratory; hypotheses about possible outcomes have objective probabilities when we are considering a chance process.)

We might be suspicious of the 'probability argument against evolution' because the history of life on earth is not amenable to a metaphysical count. However, if we gave the evolutionary hypothesis a neutral 50/50

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[35] See T. Childers, *Philosophy & Probability* (Oxford: Oxford University Press, 2013).

[36] This won't be the correct probability except in a metaphysical argument; the probability of a protein's occurrence is a function of its chemistry: a large chain of amino acids and the probability of a sequence is a function of those probabilities.

[37] Miller, "The Flagellum Unspun: The Collapse of 'Irreducible Complexity'", 90.

[38] Sober, "The Design Argument", 102-103.

[39] Kitcher, "Born-Again Creationism" 266-268. Kitcher is (was) professor of philosophy at Columbia.

chance of being true, evidence could be adduced that would increase the odds in its favour. What we are doing here is shifting from a metaphysical doubt about counting the past to the **epistemology** of measuring hypotheses and their evidence.

Evidence might well contribute to raising the probability of something being the case, but it may not look too relevant.[40] We appreciate evidence in a qualitative way that makes the assignment of probabilities to some evidence and the effect on the probability of hypotheses look somewhat artificial. If we assign prior probabilities to evidence (e) and a hypothesis (h) then the probability of the hypothesis in relation to the evidence p(h/e) will be a ratio of the probability of (h) and (e) together to the probability of (e) alone. In this way we can track increases/decreases in the probability of a hypothesis—in our case evolution,[41] but the formal probability calculation will not be impressive if the evidence 'looks' wrong.

We can approach things the other way. The likelihood of a hypothesis is the probability it confers on the possibility of certain things happening or being the case; this is p(e/h) and not p(h/e) as above. The problem here is whether design and no-design hypotheses are equally predictive. Unless there are predictions, there are no possible observations upon which to confer a probability value and no basis upon which to compute the likelihood of the hypothesis as a function of those values.[42]

It is a dispute between intelligent design theorists and evolutionists as to whether intelligent design can have predictions. The temptation here is to look at some 'evidence' that is unfavourable to evolution and make that into a prediction of intelligent design. For example, the fossil record will not be gradualistic but punctuated; it will reflect long periods of stability; and it will be marked by catastrophic extinctions. However, none of these aspects of the fossil record seem to have anything to do with the notion of design *qua* design.

Is irreducible complexity a prediction of intelligent design? Complexity is relative and we might think that **simplicity has just as much right to be included within the scope of intelligent design**. Likewise, we might also wonder why reducibility should be marked down as evidence of intelligent design. Reducible co-ordinated complexity should be just as interesting to a design theorist. Certainly, if we want to use the 'intelligent design' argument to argue for the existence of a creator, we have no reason to exclude simplicity or any kind of complexity from the scope of divine action.

An evolutionist might ask, 'You have chance; why would you want to invoke divine action?' The usual answer would be that the chance of occurrence is too low. This is a subjective response but, in any event, a low probability of occurrence is not sufficient to warrant recourse to divine action as an alternative explanation. It may cause us to doubt chance (or the hypothesis which has the low probability of occurrence) and it is useful information. But, the reasoning for intelligent design should be independently grounded and not made dependent on the low probability of a chance explanation (i.e. we should not present the Design Argument as an inference to the best explanation).

Design as an Analogy

Intelligent Design theorists present design as an inductive inference in this way: all complex and functional objects whose origin we know are the products of intelligent design; we do not know the origin of complex and function biological systems but we can legitimately infer that they were so designed. Thus, our recognition of design in the human sphere allows us to infer design for the bacterium flagellum.

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[40] For example, John Smith votes conservative and seventy percent of Smiths of page 591 of the telephone directory vote conservative; this probability value isn't relevant to an explanation of why he votes conservative – Swinburne, *The Existence of God*, 29.

[41] Rosenberg, *Philosophy of Science*, 187; R. Swinburne, *An Introduction to Confirmation Theory* (London: Methuen & Co. Ltd., 1973), chap. 1.

[42] B. Fitelson, C. Stephens and E. Sober, "How Not to Detect Design—Critical Notice: William A. Dembski, *The Design Inference*" in *Intelligent Design Creationism and its Critics* (ed. R. T. Pennock; Cambridge, MT: MIT Press, 2001), 597-615 (613).

The inference is often supported with a probabilistic argument eliminating a chance explanation; this makes the argument an inference to the best explanation. The problem with the 'induction' is that it is at one level removed from the evidence.[43] It is not comparable to an induction involving the *same kind* of evidence such as our having observed only white swans in the past from which we might infer (draw the induction) that all swans are white; but rather the design inference is about what it is for *something analogous* to be designed. This is why critics often say that what is being compared is too dissimilar, and this is a fair point. For this reason it is not a straightforward induction, and this is why the argument is often just presented as the 'best explanation' (an abduction, see Wikipedia) of the data rather than an induction.

On the other hand, typically, from a whole series of examples of intelligent design in nature, it is inferred that *everything* is so designed. However, we have seen that this induction fails[44] because of cases of apparent design. It also fails for a further reason: we cannot simply say everything is designed because we see (our) parts of the universe as designed

If the Design Argument is not an inductive inference, is it basically a perception? The conceptual organization of perceptual data is integral to human perception, for example, there is a ubiquity to the perception of colour (even if there are exceptions). There is no such ubiquity to the 'perception' of design when many affirm that design is only an appearance or that there is design so bad it barely qualifies for the term. We cannot say therefore that we all 'see' design in a natural or instinctive way; many see design but many do not, which suggests that something other than perception is at work. Thus, typically, we might say that a person's prior beliefs influence whether s/he 'sees' design in nature.[45] The minimal point here is that in order to see something is designed we need the prior belief that it *could* be designed. Experiments in developmental psychology have shown this result.[46] Of course, one way we have acquired such beliefs about *possible* design is through Scripture. The significance of this is that the created order of human thinking may actually be this way round: the possibility of design is required first and suggested in divine revelation, and then a natural human response will be to see design in nature and have the revelation 'confirmed'.

If the Design Argument is not a simple matter of perception, what is it? The classical view is that the Design Argument is about presenting an **analogy** between complex structures, objects, devices or machines that we know have been designed and the complexity we see in biological systems—a functional or structural complexity. The point here is that the analogy is between *our* designing and making things and someone *like*[47] *us* (God and the angels) designing and making complex things.[48] So, the philosopher David Hume, a critic of the Design Argument, defines it in this way:

> The curious adapting of means to ends, throughout all nature, resembles exactly, though it much exceeds, the productions of human contrivance; of human design, thought, wisdom, and intelligence. Since therefore the effects resemble each other, we are led to infer, by all the rules of <u>analogy</u>, that the causes also resemble; and that the Author of nature is somewhat similar to the mind of man; though possessed of much larger faculties, proportioned to the grandeur of the work, which he has executed.[49]

The argument starts with observation, and so it has an evidential basis; it is an empirical argument. This is why apologists often spend all their time just describing nature. They tend to only add the design conclusion

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[43] W. L. Rowe, *Philosophy of Religion: An Introduction* (Belmont; Wadsworth, 1993), 48.

[44] Frank, "On the Assumption of Design", 116, puts forward Hume's 'Problem of Induction' as his reason for rejecting the induction.

[45] See McPherson, *The Design Argument*, chap. 2, for a discussion.

[46] H. De Cruz and J. De Smedt, "Paley's iPod: The Cognitive Basis of the Design Argument within Natural Theology" *Zygon* 45/3 (2010): 665-684 (669).

[47] The basis for this use of analogy is the point that we are in the image of likeness of God, i.e. what we ascribe to ourselves can be ascribed to God unless it is not a 'likeness' aspect.

[48] This is an application of Plantinga's thesis about the role of analogy in talk about 'other minds'—see A. Plantinga, *God and Other Minds: A Study of the Rational Justification of Belief in God* (Paperback Edition; Ithaca: Cornell University Press, 1990), chap. 8.

[49] D. Hume, *Dialogues Concerning Natural Religion* (ed. N. K. Smith; 2nd ed; London: Nelson, 1947), 143.

at the end of their discourse: i.e. they conclude by saying that what they describe is *like* (but superior to) the design of 'human contrivances' and so there must be a Divine Designer.

Two types of evidence for design are presented.[50] The first is about complexity and the second is about regularity. In biological systems we readily see many inter-dependent things presented together in a complex whole. We may even add to our description a specification of the functionality of the arrangement upon which we have focused. We treat this complexity as a design on the basis of an analogy with the complexity of human contrivances and so infer the existence of a Designer. However, it is important to remember that this notion of design is not that of 'purposive design',[51] but the design of the many parts that contribute to the functioning of a whole. It is like seeing design in a watch, but not the purpose of a watch. From the watch, we infer a watchmaker; equally, from a complex functioning arrangement in nature, we infer a designer and maker.

The second type of evidence for design is about the laws of nature which describe regularities of succession—regularities about what succeeds or follows on from what—and the analogy here is with regular types of behaviour in human society. For example, the singing of a song or the performance of a dance follows rules and a composition or choreography that has a human author. This is about what steps and moves follow on from others or what notes and vocal sounds should be made and in what order. The Design Argument is that regularity in nature is *like* regularity displayed in human behaviour and so has a corresponding divine author.[52] The point here is that while we can explain some laws of nature in terms of more basic laws, there comes a point where this reductionism stops and we just have 'the basic laws of nature'. If we are to further explain the existence of these, we have available to us a ready-made analogy with human behaviour: an agent has set up the basic regularities of nature.

The two types of evidence are very different. The first is about *the particular* and the second is about *the universal*. A classic example for the former type of evidence would be the human eye; any basic law of nature will be evidence for the latter type of evidence; the so-called 'Fine-Tuning' of the universe is an argument of the second type.[53] Each type of evidence is persuasive to those who are open to the idea of there being a god.

There is a qualification to be made with the second type of evidence. When we consider just one law of nature and seek to account for it alone, the argument is that it has its cause in the action of a creator; this is a eutaxiological argument. Where we take several interdependent laws of nature together, then we are considering them in terms of a design and the argument is that this design is the work of a designer.

Each type of argument may be persuasive to different people. In logical terms, the second type of evidence is stronger because the alternative Darwinian explanation is not available. With the first type of evidence, the combination of spontaneous changes and natural selection can be deployed to theorize about evolutionary pathways and thereby avoid the inference to a Designer. The second type of evidence is more about Physics and Chemistry and it is not part of an inference to a best explanation. With the second type of evidence we are not saying something like, 'design is a better explanation than natural selection'; rather, we are saying that the existence of the basic laws of nature need explanation and an analogy with human actions (they were set up by a Divine Designer) is the explanation.

Design as an analogy is a different kind of explanation to scientific explanation because the argument is about positing **intentional purposive action** and, moreover, **divine action**. The complex and the simple come under the purview of this action, and so there is no reason to privilege biological complexity as being

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[50] Swinburne, *The Existence of God*, 138-139.

[51] We have been excluding the notion of purpose from our argument and concentrating on the features of order, complexity and regularity. We have not been arguing that the universe was designed for the purposive use of humans – see Rowe, *Philosophy of Religion*, 48.

[52] R. Swinburne, "The Argument from Design" *Philosophy* 43 (1968): 199-212 (202).

[53] P. Jeavons, "Fine-Tuning" in *Reasons* (ed. T. Gaston; Sunderland: Willow Publications, 2011), 39-54; see also R. Swinburne, *Is There a God?* (New York: Oxford University Press, 1996), 2.

especially indicative of design. The design explanation is not about the immanent causes in nature because the designing might very well have been done remotely from nature.[54]

Two broad objections are made to the Design Argument: the first centres on the limits of the analogy and the second states that the argument cannot be verified.

First, that there are limits in an analogy is accepted. The question is whether these are sufficient to vitiate the analogy. For example, living biological organisms are not much like a watch in that the latter doesn't reproduce. Or again, we cannot infer anything about a divine designer or even know that there is only one such designer from the analogy; the limitations of finite human beings are not a satisfactory basis for inferring an infinite being. It is said that nature cannot give evidence beyond its domain, and a divine designer is, by definition, supernatural.

Pointing out the limits of an analogy does not vitiate the analogy unless the process of limitation so chips away at it that people see no point in drawing the analogy any longer. This is obviously not the case for the analogy of design in respect of the order and regularity that we see in nature.

Secondly, the charge that a claim of design cannot be verified requires a specification of what would count as verification. Within the human sphere we can verify claims of design. We can seek out knowledge of the designers and their design principles. For the Design Argument, it is only the *fact* of intelligent design that is drawn as an analogy; nothing is said about the 'intelligence'. In a Christian context, verification (talking to the designers and ascertaining their design principles) lies in the future.[55] For the present, the 'verification' lies in the complementary teaching of Scripture.

Einstein was an agnostic but he incidentally shows why the Design Argument is persuasive. He says,

> In every true searcher of Nature there is a kind of religious reverence; for he finds it impossible to imagine that he is the first to have thought out the exceedingly delicate threads that connect his perceptions. The aspect of knowledge which had not yet been laid bare gives the investigator a feeling akin to that experienced by a child who seeks to grasp the masterly way in which elders manipulate things.[56]

The force of the Design Argument is seen here in the phrase 'exceedingly delicate threads'; in the impossibility of imagining that the scientist is the first to work out these threads (i.e. it has been worked out by God); and in the simile of the child and his elders.

Conclusion

In this essay, we have presented an argument for the existence of God based on a simple analogy between biological order and regularity in nature and human contrivances and rule-following behaviours. The analogy hasn't been made dependent on a particular kind of complexity (such as irreducible or specified complexity), and it will also work with *simple* examples in biology if they *look* designed. The concept of design is not intrinsically about complexity. It takes the appearance of design observed by some and it presents the analogy to those people as a way of securing the judgment that there is actual design. It is not necessary for people to believe in God for the Design Argument to be persuasive; it is necessary that they are willing to countenance the possibility of design. Because we have just presented the argument as a simple analogy, we haven't sought to argue that design is the best explanation in probabilistic terms.

There are, of course, objections to the Argument from Design; some of these have been taken into account in this essay; others we have ignored. We have tackled the Darwinian objections rather than the 'disanalogies

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[54] De Cruz and De Smedt, "Paley's iPod: The Cognitive Basis of the Design Argument within Natural Theology", 680.

[55] This is not a trivial point. It is assumed by critics that because verification now is not possible, that the argument from design fails (Frank, "On the Assumption of Design", 115), but the time and opportunity for verification is not part of the *logic* of the argument.

[56] Quote cited from J. Bernstein, *Einstein*, (London: Fontana, 1972), 20.

of design' presented by Hume, which show that all analogies are limited (and only go so far)—which is only to be expected.[57] We have discussed the philosophy of the Design Argument rather than presented typical examples of the argument, and so we have not described biological complexity with the aim of persuading a reader that such complexity can only have been designed by God.

[57] For an introduction to Hume's arguments against design, see McPherson, *The Argument from Design*, chap. 4; and see D. Recker, "How to Confuse Organisms with Mousetraps: Machine Metaphors and Intelligent Design" in *Zygon* 45/3 (2010): 647-664 (650).