

## An Overview of Intelligent Design

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In the famous “Scopes Monkey Trial” in Tennessee in 1925, evolution was put on trial, and evolution won. In a recent trial in Pennsylvania, evolution again triumphed, this time over the theory of intelligent design. In the opinion of the judge, intelligent design was not science and therefore had no place in a biology class. My goal is to give a brief overview of the concepts behind “intelligent design,” and show how mathematics plays a role in this version of an argument for God’s existence from nature.

Arguments for the existence of God predate even Christian apologetics. In fact, the Platonic dialogues (around 400 BC) contain well-known arguments for the existence of God, although in them he is named either the “Prime Mover” or the “Good,” after the forms of Platonism. The same type of *a priori* reasoning still appears in what is commonly referred to as the “Ontological Argument” of St. Anselm around 1050 AD. While these are interesting arguments in their own right, my focus is on arguments for God’s existence based on experiences in the world around us. In particular, we will look at intelligent design, which is a version of the Teleological Argument (or argument from design) one finds in the writings of St. Thomas Aquinas around 1250 AD. He states that

“We see that... natural bodies, act for an end.... Whatever lacks knowledge cannot move towards an end, unless it be directed by some being endowed with knowledge and intelligence;... Therefore some intelligent being exists by whom all natural things are directed to their end; and this being we call God.”<sup>1</sup>

Intelligent design, strengthened by modern science, has advanced this argument and it

now provides more quantifiable evidence for God’s existence.

The simple version of this argument would be that it is evident from all the order and complexity in the universe that it has been intelligently designed. This implies there was an intelligent designer of the universe, namely, God. As St. Paul writes, the existence of God is “understood by the things that are made, even his eternal power and Godhead” (Rom. 1:20). Thus, it is only fitting that a teleological argument should have some merit. From a scientific viewpoint, however, this argument meets much opposition. One objection science has to this argument is its lack of refutability. Based on God’s incorporeal nature, disproving his existence to a person who believes in God is impossible. Similarly it is hard to prove God’s existence conclusively to the confirmed atheist. The very nature of science causes the scientist to be skeptical of every hypothesis. In fact, “the scientific publication process has skepticism built into it.”<sup>2</sup> A scientist is trained not to believe anything until evidence is provided, and that evidence needs to be compelling. Many scientists do not see the evidence for God that nature evinces, or at least they do not see it as compelling evidence. The argument that random chance, the Big Bang, and evolution could have caused all the variety in nature and all the order in the natural laws of the universe seems equally compelling to them. To make the argument from design more palatable to these skeptics, it would need to become as compelling as the commonly accepted laws of physics.

We thus turn to a version of this argument from design using some of the most modern science, which is often referred to as the anthropic principle. This refers to the natural laws governing the universe which seem to

have a design that enables our universe to exist and makes our lives possible. As Barrow and Tipler state, "One of the most important results of twentieth-century physics has been the gradual realization that there exist invariant properties of the natural world and its elementary components which render the gross size and structure of virtually all its constituents quite inevitable."<sup>3</sup> In other words, the way the natural laws are organized seems specifically designed to produce our world, and even small changes in the natural laws and constants would have precluded the existence of our universe. As an example of this, we can consider the electromagnetic fine structure constant. According to the current theories, had this constant been slightly larger, the stars would not have been warm enough to produce our forms of life on planets. Had this constant been smaller, the stars would have burned out millennia before life had evolved to our level.<sup>4</sup>

Mathematically, this is similar to chaos theory. One of the defining characteristics of a problem in chaos theory is that a very small change in the initial conditions may result in wildly different results (or behaviors of the system). If the universe is chaotic, the idea that the initial conditions were just right to evolve us by chance seems practically impossible, as the number of initial conditions is almost limitless. Even proponents of the Big Bang Theory, such as Stephen Hawking, acknowledge this improbability. According to Hawking, had the rate of expansion of the universe been changed by one part in one million million when the temperature of the universe was  $10^{10}$  degrees, there would have followed either a recollapse of matter long ago, or else the galaxies could not have condensed out of the expanding matter.<sup>5</sup> Since it is the highly sensitive natural laws of the universe that allow us to exist, these laws by their very existence and consistency point less to a random process and more to an intelligent designer, God.

Mathematically, this would not count as a proof for the existence of God, although we could classify it as evidence that God exists. Searching for more conclusive evidence, we

come to the most mathematically compelling teleological argument for the existence of an intelligent creator: information theory. We begin with the question of detecting design. Dembski argues that the way to detect intelligent design is his Complexity-Specification Criterion.<sup>6</sup> This criterion has three basic components: contingency, complexity (or improbability) and specification. Contingency shows a result was intended, complexity shows that it could not have easily happened by chance, and specification shows that there is a type of pattern in the object indicative of intelligence. The use of specification is an important move ahead in the teleological argument. There is a certain school of thought that will reject the teleological (and anthropic) arguments, with the reasoning that the natural laws that exist must exist, or we would not be here to observe them. So according to this reasoning, the natural laws would not be a sign of intelligent design.

This type of argument is not sufficient to derail the complexity-specification criterion. As an analogy, we can consider cryptography. Knowing the pattern after the decoding process is finished does not mean that there was no pattern prior to the decoding process, nor does it mean that our presence as observers made it more probable that the letters in the coded message formed a pattern containing information. However, in order for a pattern to count as a specification, it is necessary that the observation is *independent* of the pattern that it describes.

Now, given the complexity-specification criterion, we need to see how information theory relates to it. We can define the information inherent in an event to be the negative logarithm (base 2) of the probability of the event. Using this definition gives two main advantages:

- 1) The information inherent in any two events is the sum of the information in each of the events; and
- 2) The amount of information in an event increases with the complexity (improbability) of the event.

Since the information is based on the event containing it, we see that we can consider information to be specified or not according to whether the event encoding the information is specified or not. Hence we can determine both if information is complex and if it is specified. This is the type of information that can imply design. For example, a social security number is complex, specified information. The complexity consists of the number of digits, which could only be generated by chance with an extremely low probability. The specification is that the social security number belongs to you, and the digits correspond to information about your place of birth, etc. The fact that your social security number contains such information is enough to infer a designer of the license. Since the order inherent in the universe, according to our definitions, would be complex, specified information, this indicates a design at work in our universe.

The only objection to this argument for a designed universe is to reject the hypotheses. That there is complex, specified information in the world is quite clear, so one needs to ask if it could have arisen by chance, or if it really implies a designer. In order to answer this question, one needs to determine a reasonable amount of information that can be attributed to chance; any more information than this would indicate design. (We note that once information is created, the amount of information that can be passed on by laws governing information transfer can never exceed the amount of information encoded in the original event without the existence of an intelligent outside agency.<sup>7</sup>) To determine the amount of information that can be attributed to chance, following Dawkin's argument,

This ration [of luck] has, as its upper limit, the number of eligible planets in the universe...We have at our disposal,..., odds of 1 in 100 billion billion as an upper limit...Suppose we want to suggest, for instance, that life began when both DNA and its protein – based replication machinery spontaneously chanced to come into

existence. We can allow ourselves the luxury of such an extravagant theory, provided that the odds against this coincidence occurring on a planet do not exceed 100 billion billion to one.<sup>8</sup>

Using an even more stringent probability bound of  $10^{-150}$  would give a corresponding complexity bound of 500 bits of information.<sup>9</sup> Since in DNA there are around 30,000 genes all encoding bits of information,<sup>10</sup> one can see that there is design at work in our universe. Dawkins posits that the design is the result of cumulative natural selection, and that the probability of obtaining this amount of information is not as low as the pure mathematics of the process would indicate. Ultimately, when dealing with statistics it is possible to argue against the premises (as Dawkins does) or that our limit of improbability is not low enough. This brings up an important point: one can never use statistics to prove an event could not happen. One can merely use it to show the unlikelihood of the event. The argument from design, therefore, does not prove tht life did not spontaneously begin.

Even so, this argument is very satisfying for three reasons. First, it appeals to a mathematical definition of order and design: it gives rigorous definitions to the inquiry, and can numerically quantify the level of design, or non-design, in an object.

Second, this theory allows one to determine what constitutes a reasonable amount of chance occurrence. If there is more information than can be explained by chance, the idea of design must be given the same weight of evidence as any other scientific theory which is obtained by experiment. Referring to Newton's laws of motion as an example, there is a preponderance of evidence for these laws. Experiment after experiment backs them up. However, it is possible that there is no real pattern behind these laws, and that the string of experimental success is due to no more than an incredible string of chance occurrence. Scientists dismiss this as absurd, since the probability of such a string of success purely due to chance is so low as to be

effectively zero. And yet a similar probability for the evolution of intelligent life is taken as sufficient to support evolution, or at least is not used as evidence in its refutation. A certain double standard is at play here in the scientific community, and the appeal to a reasonable amount of information created by chance brings this out clearly.

Third, it ties in very nicely with the ancient Greek philosophy of an unmoved mover, or an efficient cause for the universe. Here we have a design posited, and that raises the issue of a designer. While Dembski does not explicitly state that this is God, it is clearly the direction that the argument takes. Of course, philosophically, this gives God no attributes other than the intelligence seen in the design of the universe. This returns us to the ancient Platonic conception of God, this time using modern mathematical methods and hence arguments unavailable to Plato and the others. The closing of this circle in Western philosophy is aesthetically pleasing and makes the argument more elegant.

The highly unfortunate aspect of this theory is that it leaves us with a God whose attributes we cannot explicitly know by nature. This, however, should not bother the Christian. The natural knowledge of God only indicates that God exists; one still needs to “discover” his nature and purpose. For the Christian, this knowledge of the nature and purpose of God can be found in the Bible. Ultimately, then, the Bible is the place we need to look to discover God -- science and philosophy alone cannot do it. In the end, science can help convince one that there is design in the universe and that mankind must be created beings, even though this knowledge is also an innate gift from God. Thus the Christian can join with King David in saying, “I will praise thee; for I am fearfully and wonderfully made; marvelous are thy works, and that my soul knoweth right well” (Ps 139:14 KJV).

## End Notes

- <sup>1</sup> St. Thomas Aquinas, “Proving God’s Existence from Experience,” in The Writings of Saint Thomas Aquinas, ed. A.C.Pegis, (Random House Pub. Co., Inc, 1945), found in Introduction to Philosophy: Collected Readings, 2d Ed., (University of Dayton Press, 1987) 8.
- <sup>2</sup> Walter R. Hearn, “Evidence of Purpose in the Universe”, in Evidence of Purpose, Ed. J.M. Templeton (New York: The Continuum Publishing Company, 1994), 62.
- <sup>3</sup> J.D.Barrow and F.J.Tipler, The Anthropic Cosmological Principle, (New York: Oxford University Press, 1986), 5.
- <sup>4</sup> B.J.Carr and M.J.Rees, “The Anthropic Principle and the Structure of the Physical World”, Nature 278, (1979) : 605-612.
- <sup>5</sup> Stephen W. Hawking, A Brief History of Time, (New York: Bantam Books, 1988), 121-122.
- <sup>6</sup> William A. Dembski, Intelligent Design, (Downer’s Grove, IL: InterVarsity Press, 1999), 122-179.
- <sup>7</sup> William A. Dembski, Intelligent Design, (Downer’s Grove, IL: InterVarsity Press, 1999), 160-165.
- <sup>8</sup> Richard Dawkins, The Blind Watchmaker, (New York: Norton, 1987), 139, 145-146.
- <sup>9</sup> William A. Dembski, Intelligent Design, (Downer’s Grove, IL: InterVarsity Press, 1999), 167.
- <sup>10</sup> Jarrod Erbe, Personal Communication, June 26, 2001.