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DARWIN, DESIGN, AND DYSTELEOLOGY:  
A CRITICAL EVALUATION OF WILLIAM DEMBSKI  
AND FRANCISCO AYALA ON THE PROBLEM  
OF SUBOPTIMAL DESIGN

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A Dissertation  
Presented to  
the Faculty of  
The Southern Baptist Theological Seminary

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In Partial Fulfillment  
of the Requirements for the Degree  
Doctor of Philosophy

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by  
Michael Caryl Berhow

May 2017

APPROVAL SHEET

DARWIN, DESIGN, AND DYSTELEOLOGY:  
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OF SUBOPTIMAL DESIGN

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To Becky,  
my wonderful wife  
and to Gus and Frankie,  
our delightful toddlers

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## PREFACE

This dissertation has been an exciting, rewarding, and challenging scholarly endeavor. I am thankful for all those who have encouraged and coached me through the process, especially for Ted Cabal and James Parker, who took time to befriend a young seminary student. Cabal stimulated my thinking in every class during my M.Div. years, and then motivated me to pursue a Ph.D. after seminary. Parker's teaching and emphasis on worldview studies provided me with invaluable categories to see every area of life from a Christian perspective.

I am also thankful for Douglas Blount for serving on my dissertation committee; for Mike Hildreth for serving as my external reader; for Greg Peterson, who provided useful critiques of each chapter; and for Chris Bolt, Matt Albanese, Peter Mosher, and Mark Warnock, my seminary friends who sharpened my thinking theologically, missiologically, and ecclesiologically. In addition to all those who inspired me academically, I am grateful to Veritas Church (my church family in Brookings, SD), the Dakota Baptist Convention, and the North American Missions Board, all who provided me the opportunity to finish my Ph.D. while church planting. Last, I want to thank my wife, Becky, for working countless hours as a nurse, supporting me through seminary, serving the women at our church, and being an excellent mother to Gus and Frankie. I could not have completed this project without the support of so many people. God is faithful!

Mike Berhow

Brookings, South Dakota

May 2017

## CHAPTER 1

### INTRODUCTION

A common theological critique of intelligent design (ID) centers on the problem of dysteleology. This problem states that because there are clear examples of suboptimal design in biology, life is probably not the product of an engineer-like designer. If it were, then one could argue that the designing agent falls short of perfection. Francisco Ayala (an ID critic) expresses this sentiment in the following question: “If functional design manifests an Intelligent Designer, why should not deficiencies indicate that the Designer is less than omniscient, or less than omnipotent?”<sup>1</sup> This dissertation critically evaluates two approaches to answering this question, one offered by Ayala and the other offered by William Dembski (an ID advocate).

In *Darwin’s Gift to Science and Religion*, Ayala describes numerous examples of defects and dysfunctions in the natural world. He argues that such examples undermine ID and further maintains that Darwinian evolution offers a profound but simple explanation for these defects and dysfunctions. For this reason, Ayala encourages religious believers to embrace Darwin’s theory, since it gets God off the hook regarding natural evil and suboptimal design. His argument is theological in nature, and my goal is to articulate the argument and then compare it with Dembski’s version of ID. My central thesis is that while Ayala does provide useful insights into the problem of dysteleology, he fails to undermine the notion of teleology expressed in Dembski’s ID project. To defend this thesis, I explore Ayala’s main theological critique of ID and contend that his

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<sup>1</sup>Francisco J. Ayala, *Darwin’s Gift to Science and Religion* (Washington, DC: Joseph Henry, 2009), 22.

arguments are incoherent without a prior metaphysical commitment to discernable teleology in nature.

### **Background**

Proponents of dysteleological arguments claim that the natural world (particularly in biology) contains countless examples of suboptimal design. These examples purportedly deliver scientific evidence demonstrating that God was not involved in creating life, and therefore represent a counterargument to various versions of the teleological argument. The term itself originated from Ernst Haeckel's *The History of Creation* (1884), where he explains,

The infinite importance of the study of rudimentary organs for the fundamental questions of natural philosophy cannot be too highly estimated; we might set up with their aid a theory of the *unsuitability of parts* in organisms, as a counter-hypothesis to the old popular doctrine of the *suitability of parts*. This latter dualistic teleology finally leads us to supernatural dogmas and miracles, whereas we obtain from the former, monistic dysteleology, a firm foundation for our mechanical interpretation of nature.<sup>2</sup>

Haeckel reminds readers in this passage that nature is not consistent regarding the suitability of parts within organisms. Some organisms certainly display features of intricate optimality, but others do not. Would it be wise, then, for one to interpret optimal design from a teleological perspective, and then interpret suboptimal design from a dysteleological perspective? Haeckel argues that such a dualistic interpretation would lead to supernatural dogmas that are not helpful in science. If one interprets nature solely from a dysteleological perspective, however, then one can affirm a mechanistic view of reality, which Haeckel claims is advantageous for science.<sup>3</sup>

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<sup>2</sup>Ernst Haeckel, *The History of Creation: Or, the Development of the Earth and its Inhabitants by the Action of Natural Causes*, 6<sup>th</sup> ed. (New York: Appleton, 1914), 1:331.

<sup>3</sup>Haeckel's dysteleological perspective is closely related to methodological naturalism (the philosophical claim that scientific investigations should be limited to purely natural causes and events).

## Dysteleology and Atheism

Many atheists, while recognizing that dysteleology does not prove the non-existence of God, utilize Haeckel's dysteleological argument to develop a moderate case for atheism.<sup>4</sup> These atheists maintain that scientific developments from William Paley to Charles Darwin provide a historical case study that illustrates the increasing irrelevance of theism, or teleological explanations, within science. According to this narrative, Paley developed sophisticated scientific arguments in 1802 to demonstrate God's existence by appealing to the apparent design of complex organisms. He famously argued that there "cannot be design without a designer; contrivance without a contriver; order without choice," and then skillfully presented numerous cases of apparent design in nature.<sup>5</sup> One can easily concede that Paley's teleological argument was based upon the best science of the early nineteenth century, and even that his interpretation of the evidence represented the prevailing wisdom of his day.<sup>6</sup> As science progressed in the nineteenth century, however, Darwin introduced an alternative explanation for the contrivances of nature. He proposed that natural selection acting upon variations within organisms could sufficiently explain the apparent design of life.<sup>7</sup> This proposal presumably represents a watershed

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<sup>4</sup>By moderate atheism, I am referring to what Antony Flew called "the presumption of atheism." Antony Flew, "The Presumption of Atheism," in *Contemporary Perspectives on Religious Epistemology*, ed. R. Douglas Geivett and Brendan Sweetman (Oxford: Oxford University Press, 1992), 19-32. This perspective is sometimes called *negative atheism*, *weak atheism*, or *soft atheism*. In short, moderate atheists attempt to clarify the meaning of atheism by proposing that atheism is not a positive position. It does not assert the non-existence of God, rather it "lacks belief" when it comes to any theistic or supernatural claim. On this view, atheism is considered a default position. When a theist argues for the existence of God, therefore, he bears the full burden of proof. If an atheist successfully undermines the theist's arguments, then atheism is considered more reasonable by default.

<sup>5</sup>William Paley, *Natural Theology* (Oxford: Oxford University Press, 1802), 12.

<sup>6</sup>Agreeing with this sentiment, Ayala writes, "Paley elaborated the argument-from-design with greater cogency and more extensive knowledge of biological detail than had any other author, before or since." Francisco J. Ayala, "From Paley to Darwin: Design to Natural Selection," in *Back to Darwin: A Richer Account of Evolution*, ed. John Cobb Jr. (Grand Rapids: Eerdmans, 2008), 58.

<sup>7</sup>Darwin's specific contribution (with Alfred Russel Wallace) to evolutionary theory was the idea of natural selection. There were many before Darwin who argued that organisms go through variations and change over time. Georges Cuvier, James Hutton, Jean-Baptiste Lamarck, Robert Edmond

moment in the field of biology, because Darwin offered a plausible naturalistic mechanism to explain biological diversity *without divine intervention*.<sup>8</sup> In addition to this achievement, Darwin's theory also solved problems that Paley's thesis seemingly produced.<sup>9</sup> The notable example for this dissertation is the problem of dysteleology. Why would God create some organisms to display features of suboptimal design? This question posed a potential challenge to the design hypothesis, but not to Darwin's theory, since the mechanism of natural selection is a mindless (rather than teleological) process.<sup>10</sup>

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Grant, Étienne Geoffroy Saint-Hilaire, Erasmus Darwin, and Robert Jameson all demonstrated this idea. Darwin argued that natural selection operates on variations, causing some organisms to flourish and others to suffer extinction. He wrote, "Let it be borne in mind how infinitely complex and closefitting are the mutual relations of all organic beings to each other and to their physical conditions of life. Can it, then, be thought improbable, seeing that variations useful to man have undoubtedly occurred, that other variations useful in some way to each being in the great and complex battle of life, should sometimes occur in the course of thousands of generations? If such do occur, can we doubt (remembering that many more individuals are born than can possibly survive) that individuals having any advantage, however slight, over others, would have the best chance of surviving and of procreating their kind? On the other hand, we may feel sure that any variation in the least degree injurious would be rigidly destroyed. This preservation of favourable variations and the rejection of injurious variations, I call Natural Selection." Charles Darwin, *On the Origin of Species* (Oxford: Oxford University Press, 1859), 63.

<sup>8</sup>Concerning whether a designing agent was involved in the process of evolution, Darwin writes, "If we must compare the eye to an optical instrument, we ought in imagination to take a thick layer of transparent tissue, with a nerve sensitive to light beneath, and then suppose every part of this layer to be continually changing slowly in density, so as to separate into layers of different densities and thicknesses, placed at different distances from each other, and with the surfaces of each layer slowly changing in form. Further we must suppose that there is a power always intently watching each slight accidental alteration in the transparent layers; and carefully selecting each alteration which, under varied circumstances, may in any way, or in any degree, tend to produce a more distinct image. We must suppose each new state of the instrument to be multiplied by the million; and each to be preserved till a better be produced, and then the old ones to be destroyed. In living bodies, variation will cause the slight alterations, generation will multiply them almost infinitely, and natural selection will pick out with unerring skill each improvement. Let this process go on for millions on millions of years; and during each year on millions of individuals of many kinds; and may we not believe that a living optical instrument might thus be formed as superior to one of glass, as the works of the Creator are to those of man?" *Ibid.*, 141-42. In this passage, Darwin implicitly agrees that God is not needed for biological development, at least not in the way Paley suggested. For Darwin, natural selection working upon variations over millions of years is sufficient to explain the design of complex organisms like the eye.

<sup>9</sup>Paley did address the problem of suboptimal design in *Natural Theology*, and I will explicate his response in chap. 2. In short, Paley argued that examples of suboptimal design do not negate positive evidences for design. See Paley, *Natural Theology*, 37. Of course, one could also utilize ideas derived from traditional Christian theology, such as the doctrine of the fall, to overcome the problem of suboptimal design. I intend to examine the implications of the fall in later chapters.

<sup>10</sup>In numerous places throughout the *Origin of Species*, Darwin highlights imperfections within the natural world. He argues that these imperfections fit well within a survival-of-the-fittest perspective on

As modern scientists continued to discover evidence of suboptimal design in biology, therefore, they were weakening Paley's case while simultaneously supporting Darwin's. Thus, Darwin's theory ostensibly provides greater simplicity and explanatory scope when it comes to the problem of dysteleology.

How does this Paley-to-Darwin historical case study lend support for moderate atheism? Some atheists answer this question by emphasizing that the story represents a common trend in the history of science and religion. As our understanding of the natural world increases, scientific (or naturalistic) explanations eventually replace theistic (or teleological) explanations. The scientific explanations arising from Darwinian evolution are simply the latest and most dramatic expressions of this trend. Richard Dawkins explains,

It is sometimes said that [David Hume] disposed of the Argument from Design a century before Darwin. But what Hume did was criticize the logic of using apparent design in nature as *positive* evidence for the existence of God. He did not offer any *alternative* explanation for apparent design, but left the question open. An atheist before Darwin could have said, following Hume: 'I have no explanation for complex biological design. All I know is that God isn't a good explanation, so we must wait and hope the somebody comes up with a better one.' I can't help feeling that such a position, though logically sound, would have left one feeling pretty unsatisfied, and that although atheism might have been *logically* tenable before Darwin, Darwin made it possible to be an intellectually fulfilled atheist.<sup>11</sup>

This famous passage by Dawkins recognizes that Darwin's great accomplishment was to remove the most persuasive evidence for God's existence, namely, the evidence from design. Natural selection, Dawkins argues, "not only explains the whole of life; it also raises our consciousness to the power of science to explain how organized complexity

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nature. He explains, "Natural selection tends only to make each organic being as perfect as, or slightly more perfect than, the other inhabitants of the same country with which it has to struggle for existence. And we see that this is the degree of perfection attained under nature . . . . Natural selection will not produce absolute perfection, nor do we always meet, as far as we can judge, with this high standard under nature. The correction for the aberration of light is said, on high authority, not to be perfect even in that most perfect organ, the eye." Darwin, *Origin of Species*, 151.

<sup>11</sup>Richard Dawkins, *The Blind Watchmaker: Why the Evidence of Evolution Reveals a Universe without Design* (New York: W.W. Norton, 1996), 10.

can emerge from simple beginnings without any deliberate guidance.”<sup>12</sup> And if the evidence for deliberate guidance is sparse, then what evidence is left to demonstrate God’s existence?<sup>13</sup> Dawkins claims that there is no evidence, and thus the existence of God becomes increasingly improbable for those who are scientifically informed.<sup>14</sup>

I reference this moderate version of atheism, because Ayala’s main argument against ID ironically resembles Dawkins’ case against theism. The difference is that Ayala turns this dysteleological argument on its head to make it an apologetic *for theism*, minus any teleological conception of nature. He does this by suggesting that ID is poor

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<sup>12</sup>Richard Dawkins, *The God Delusion* (New York: Houghton Mifflin, 2006), 116.

<sup>13</sup>Of course, one can think of modern scientific developments where the evidence for deliberate guidance seems strong. The development and continued success of big bang cosmology, for example, has aided many apologists in developing sophisticated versions of the cosmological argument. There are also fine-tuning arguments that provide compelling reasons to think that the physical constants of the universe were deliberately adjusted for the purpose of sentient life on earth. For the purpose of this dissertation, however, I do not explore claims of deliberate guidance outside the area of biology. And within the biological sciences, there seems to be a consensus that naturalistic mechanisms are sufficient for explaining the apparent design of organic life. These explanations rely heavily upon methodological naturalism (MN), a philosophical position that is contested by ID advocates. In my review of Dembski’s work, I provide the basic arguments for actual design within biology. For further critiques of the prevailing wisdom in biology regarding MN, see Michael Behe, *Darwin’s Black Box: The Biochemical Challenge to Evolution* (New York: Free, 1996); idem, *The Edge of Evolution: The Search for the Limits of Darwinism* (New York: Free, 2007); Phillip Johnson, *Darwin on Trial*, 3<sup>rd</sup> ed. (Downers Grove, IL: InterVarsity, 2010); idem, *Reason in the Balance: The Case against Naturalism in Science, Law and Education* (Downers Grove, IL: InterVarsity, 1995); Stephen Meyer, *Darwin’s Doubt: The Explosive Origin of Animal Life and the Case for Intelligent Design* (New York: HarperOne, 2013); idem, *Signature in the Cell: DNA and the Evidence for Intelligent Design* (New York: HarperOne, 2009); and Alvin Plantinga, *Where the Conflict Really Lies: Science, Religion, & Naturalism* (Oxford: Oxford University Press, 2011).

<sup>14</sup>Dawkins, *The God Delusion*, 51. Dawkins defines his perspective as *De facto* atheism. He expresses this perspective when he writes, “I don’t know for certain but I think God is very improbable, and I live my life on the assumption that he is not there” (51), and then illustrates it by explaining that most people are atheists when it comes to “Zeus, Apollo, Amon Ra, Mithras, Baal, Thor, Wotan, the Golden Calf and the Flying Spaghetti Monster. I just go one god further” (53). While Dawkins is convinced that God is not real, his *De facto* atheism is appropriately classified as moderate atheism, since he does not refer to atheism as a positive position. Science and religion scholars often argue that skeptics like Dawkins wrongly use scientific resources when exploring theological issues. These scholars maintain that the disciplines of science and theology, while certainly in dialogue, represent two separate modes of inquiry. Dawkins responds to this type of critique in his response to Stephen Jay Gould’s NOMA proposal. He asks, “Why shouldn’t we comment on God, as scientists? And why isn’t Russell’s teapot, or the Flying Spaghetti Monster, equally immune from scientific skepticism? As I shall argue in a moment, a universe with a creative superintendent would be a very different kind of universe from one without. Why is that not a scientific matter?” (55). This response represents a version of scientism, where science is held as the only (or at least the most significant) form of knowledge.

theology, and therefore does not represent an erudite version of theism. He agrees with Dawkins that Darwin overturned the design argument, and thus demonstrated that God did not create biological life. He disagrees with Dawkins', however, regarding his atheistic conclusions. For Ayala, Darwin is a gift for theists, because Darwin's theory reveals that God is not responsible for suboptimal design. This preserves the notion of divine goodness; making natural selection the solution to physical evil. Ayala explains,

Traditional theology distinguishes three kinds of evil: (1) moral evil or sin, the evil originated by human beings; (2) pain and suffering as experienced by human beings; (3) physical evil, such as floods, tornados, earthquakes, and the imperfections of all creatures. Theology has a ready answer for the first two kinds of evil. Sin is a consequence of free will; the flip side of sin is virtue, also a consequence of free will.... [But] what about earthquakes, storms, floods, droughts, and other physical catastrophes? Enter modern science into the theologian's reasoning. Physical events are built into the structure of the world itself.<sup>15</sup>

Ayala further contends that Darwin's great contribution to modern science was to show that "nothing in the world of nature escapes the scientific mode of knowledge."<sup>16</sup> And herein lies his theological critique of ID. ID advocates presumably fail to appreciate the theological benefits of affirming a reality where all physical events are "built into the structure of the world itself." Those who argue (like Paley) that God is responsible for beautiful and complex physical events are, according to Ayala, inadvertently ascribing dishonorable attributes to God's character. He debates this point on the basis of consistency. If God is responsible for *some design*, then God apparently must be responsible for *all design*.<sup>17</sup> This implies that God designed eyes with blind spots, human

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<sup>15</sup>Ayala, *Darwin's Gift*, 3-4.

<sup>16</sup>Ayala, "From Paley to Darwin," 57.

<sup>17</sup>Taken at face value, Ayala's consistency critique of ID does not seem persuasive. Behe, for example, explains why such a complaint is wrongheaded when he writes, "One difficulty of writing a book questioning the sufficiency of Darwin's theory is that some people mistakenly conclude you're rejecting it in toto. It is time to get beyond either or thinking. Random mutation is a completely adequate explanation for some features of life, but not for others. This book looks for the line between the random and the nonrandom that defines the edge of evolution." Behe, *The Edge*, 14. In chaps. 2 and 3, I offer additional support to Ayala's consistency critique before rejecting it.

jaws that are too small for teeth, birth canals that are too narrow for easy passage of the infant's head, spontaneous miscarriages, cancer cells, sickle-cell anemia, and all the other dysfunctional and cruel peculiarities of life.<sup>18</sup> Theological speaking, the implications of ID allegedly support the notion that God is either not omnibenevolent, or omnipotent. Ayala, therefore, encourages religious believers to reject ID.

To evaluate Ayala's dysteleological critique of ID, I compare his work to Dembski's. For some circles within science and religion scholarship, drawing upon a scholar like Dembski is controversial.<sup>19</sup> However, Ayala's main contribution to science and religious scholarship is his evolutionary theodicy, which explicitly rejects ID and any teleological understanding of nature. To properly evaluate his theodicy, therefore, it necessitates engaging responsibly with one of ID's leading thinkers. This is something that, unfortunately, many critics of ID fail to do. My attitude toward both Ayala and Dembski is one of respect and charity. Both thinkers contribute to science and religious scholarship, both are Christian theologians, and both have insights that are relevant for the problem of dysteleology.

### **Dembski's Background**

Dembski, as of 2014, was a Senior Fellow with the Discovery Institute's Center for Science and Culture, and Senior Research Scientist with the Evolutionary Informatics Lab. He has published numerous mathematical and philosophical articles related to ID. His educational credentials include master's degrees in statistics, mathematics, philosophy, and divinity (two from the University of Chicago, one from the

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<sup>18</sup>Ayala, *Darwin's Gift*, 154-60.

<sup>19</sup>This became apparent to me after attending various science and religion receptions at the American Academy of Religion's Annual Meetings in 2015 (specifically the receptions for the American Association for the Advancement of Science, the Institute on Religion in an Age of Science, the Zygon Center for Religion and Science, the Center for Theology and Natural Science, and Templeton). When I described my dissertation project to other members, many were puzzled by my insinuation that Dembski or ID in general had something important to contribute to the science and religion dialogue. Not everyone shared this sentiment, but it was certainly common.

University of Illinois, and one from Princeton Theological Seminary). He has two Ph.D.s, one in philosophy from the University of Illinois and one in mathematics from the University of Chicago. He has completed postdoctoral work at MIT, Princeton, Northwestern University, the University of Notre Dame, and the University of Chicago. His research interests include ID, complexity theory, information, cryptography, chaos theory, and probability theory. He has authored or co-authored eleven books, edited or co-edited several more, and published numerous articles in academic books and journals. As for his academic posts, Dembski has taught in several seminaries and Christian universities, including Southern Evangelical Seminary, Southwestern Baptist Theological Seminary, The Southern Baptist Theological Seminary, and Baylor University.

Dembski's scientific work on ID can be found in several works, most notably in *The Design Inference: Eliminating Chance Through Small Probabilities* (Cambridge, 1998).<sup>20</sup> Dembski describes this work as a scientific analysis of the connections linking chance, probability, and intelligent causation. It explores ideas and methods closely related to probability and complexity theory, and Dembski argues throughout the book that there is an objective criterion to determine whether an event is derived from intelligent causation. Specifically, Dembski calls this criterion specified complexity (SC) or complex specified information (CSI). He argues that when any event X exhibits features that are both specified and complex, one can reasonably infer that X is the result of design. Dembski's method is certainly relevant to the ID debate; however, the implications of his work expand well beyond the limits of biology. He proposes that *The Design Inference* is relevant for forensic scientists, SETI researchers, insurance fraud investigators, debunkers of psychic phenomena, intellectual property attorneys,

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<sup>20</sup>William A. Dembski, *The Design Inference: Eliminating Chance through Small Probabilities* (Cambridge: Cambridge University Press, 1998).

investigators of data falsification, cryptographers, parapsychology researchers, and programmers of (pseudo-) random number generators.<sup>21</sup>

*No Free Lunch: Why Specified Complexity Cannot be Purchased without Intelligence*<sup>22</sup> was Dembski's second scholarly work, which was the product of a \$100,000 research grant issued by the Templeton Foundation. Whereas *The Design Inference* sought to develop an objective method for detecting design, *No Free Lunch* utilized that method to demonstrate that chance mutations and natural selection working together are incapable of generating SC.<sup>23</sup> Dembski's goal in his second book was to reintroduce the idea of *actual* design in biology. He explains, "because design in biology so often connotes apparent design, putting intelligent in front of design ensures that the design we are talking about is not merely apparent but also actual."<sup>24</sup> Dembski's clarification between apparent and actual design is significant for this dissertation, since it elucidates what the word "intelligent" means in ID. By describing *intelligent* design as *actual* design, Dembski is proposing that *intelligent* design is not necessarily *optimal* design. This clarification will be crucial for evaluating Ayala's dysteleological critique of ID.

After Dembski's initial academic publications, he released several other books intended for a general audience. The most notable is *The Design Revolution: Answering the Toughest Questions about Intelligent Design*.<sup>25</sup> This book is significant because it

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<sup>21</sup>Dembski, *The Design Inference*, xii.

<sup>22</sup>William A. Dembski, *No Free Lunch: Why Specified Complexity Cannot Be Purchased without Intelligence* (Lanham, MD: Rowman & Littlefield, 2002), xiii.

<sup>23</sup>*Ibid.*, xiii.

<sup>24</sup>*Ibid.*, xvii.

<sup>25</sup>William A. Dembski, *The Design Revolution: Answering the Toughest Questions about Intelligent Design* (Downers Grove, IL: InterVarsity, 2004).

directly and extensively defends the claim that ID is a respectable scientific research program. In the preface, Dembski writes,

This book is my attempt to cut through the red tape, psychological inertia and mental cobwebs that prevent intelligent design from receiving fair consideration. In short, it is my attempt at some much needed house cleaning. Even so, my hopes for this book would fall short if a clean house were its only outcome. Besides cleaning house, this book aspires to provide a powerful new vision of science and the world, one that people will want to pursue because they find it so attractive.<sup>26</sup>

While one could dispute whether Dembski truly provides “a powerful new vision for science and the world,” *The Design Revolution* does provide several helpful clarifications regarding the scientific project of ID. Specifically, it defines the fundamental claim of ID as follows: “there are natural systems that cannot be adequately explained in terms of undirected natural forces and that exhibit features which in any other circumstance we would attribute to intelligence.”<sup>27</sup> Building on this definition, Dembski further describes the scientific work of ID as follows:

1. Producing an objective method (SC) that distinguishes *intelligent causation* from *chance* or *necessity*.
2. Producing scientific and/or mathematical arguments that demonstrate the inadequacy of Darwinian mechanisms to produce SC.
3. Producing evidence that supports the claim that there are certain features in the natural world that cannot be explained by undirected natural forces.

When I refer to the “science of ID” or “ID as a scientific research project” throughout this dissertation, I will refer to one of these three statements.

Dembski’s theological works are also significant.<sup>28</sup> The three most noteworthy are *Intelligent Design: The Bridge between Science and Theology*, *The End of*

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<sup>26</sup>Dembski, *The Design Revolution*, 27-28.

<sup>27</sup>Ibid., 27.

<sup>28</sup>There is a certainly an overlap between Dembski’s scientific and theological work, and therefore I am not making strict distinctions. Dembski’s scientific work often addresses philosophical issues that some science and religion scholars consider metaphysical or theological in nature. On the other

*Christianity: Finding a Good God in an Evil World*, and most recently *Being as Communion: A Metaphysics of Information*.<sup>29</sup> In *The Bridge between Science and Theology*, Dembski broadens his definition of ID, calling it a “scientific research program that investigates the effects of intelligent causes; an intellectual movement that challenges Darwinism and its naturalistic legacy; and a way of understanding divine action.”<sup>30</sup> The additional category in this definition describes ID as *a way of understanding divine action*. This fourth description makes ID a theological research project, and as such should be distinguished from the scientific research project of ID.<sup>31</sup>

It may be helpful to mention that these two distinct research projects have caused confusion among ID critics. Is ID a scientific research program or a theological research program? In his article “Intelligent Design: The Faith That Dare Not Speak Its Name,” Jerry Coyne draws attention to the confusion raised by this question. His article begins with an attempt to discredit ID by emphasizing so-called discrepancies within ID literature. He specifically cites two passages by Dembski, one claiming that ID is “not an evangelical Christian thing, or a generally Christian thing or even a generically theistic thing.”<sup>32</sup> In the next passage, Dembski writes, “any view of science that leaves Christ out

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hand, his theological work often explores issues that are generally viewed as restricted to scientific investigation. By referring to some of Dembski’s works as scientific and others as theological, therefore, I am simply attempting to classify the general themes of each work.

<sup>29</sup>William A. Dembski, *Intelligent Design: The Bridge between Science & Theology* (Downers Grove, IL: InterVarsity, 1999); idem, *The End of Christianity: Finding a Good God in an Evil World* (Nashville: B & H, 2009); idem, *Being as Communion: A Metaphysics of Information* (Burlington, VT: Ashgate, 2014).

<sup>30</sup>Dembski, *The Bridge*, 13.

<sup>31</sup>In a later chapter, I provide additional details regarding the distinctions between ID as a scientific research program and ID as a theological research program. While many ID advocates insist that ID is not a theological research program, Dembski’s ID project is certainly theological, since he defines ID as “a way of understanding divine action.”

<sup>32</sup>Dembski, *The Design Revolution*, 25.

of the picture must be seen as fundamentally deficient.”<sup>33</sup> After citing these passages next to each other, Coyne asks,

Well, which is it? Is ID merely a sophisticated form of biblical creationism, as most biologists claim, or is it science - an alternative to Darwinism that deserves discussion in the science classroom? As the two quotations above imply, you won't find the answers in the writings of the leading advocates of ID. The ambiguity is deliberate, for ID is a theory that must appeal to two distinct constituencies. To the secular public, ID proponents present their theory as pure science. This, after all, is their justification for a slick public-relations campaign promoting the teaching of ID in the public schools. But as is clear from the infamous “Wedge Document” of the Discovery Institute, a right-wing think tank in Seattle and the center for ID propaganda, intelligent design is part of a cunning effort to dethrone materialism from society and science and replace it with theism. ID is simply biblical creationism updated and disguised to sneak evangelical Christianity past the First Amendment and open the classroom door to Jesus. The advocates of ID will admit this, but only to their second constituency, the sympathetic audience of evangelical Christians on whose support they rely.<sup>34</sup>

Coyne's conspiracy theory, represented in the paragraph above, characterizes the type of critique usually raised against ID advocates. And yet, this kind of critique displays an obvious ignorance of basic distinctions clarified by ID thinkers. One only needs to read the full paragraph of Dembski's first quote to see this ignorance. Dembski writes,

This is not a book in which I address the theodicy problem (I plan to address it in a future book on Genesis, theodicy and the Christian doctrine of creation). Although theodicy is, to be sure, the thorniest problem facing theologians trying to make sense of intelligent design, it is not a problem for intelligent design per se. Intelligent design attempts to understand the evidence for intelligence in the natural world. The nature and, in particular, the moral characteristics of that intelligence constitute a separate inquiry. Intelligent design has theological implications, but it is not a theological enterprise. Theology does not own intelligent design. *Intelligent design is not an evangelical thing, or a generically Christian thing or even a generically theistic thing.* Anyone willing to set aside naturalistic prejudices

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<sup>33</sup>Dembski, *The Bridge*, 206.

<sup>34</sup>Jerry A. Coyne, “Intelligent Design: The Faith That Dare Not Speak Its Name,” in *Intelligent Thought: Science Versus the Intelligent Design Movement*, ed. John Brockman (New York: Vintage, 2006), 3-4.

and consider the possibility of evidence for intelligence in the natural world is a friend of intelligent design.<sup>35</sup>

Only by refusing to include the whole paragraph could one think that Dembski is appealing to “two distinct constituencies.” Dembski does think ID is a scientific research program, and much of his contribution to ID develops that case. He is also a Christian theologian, however, and thinks ID has theological implications.

Dembski’s distinctions mentioned above are straightforward, and even common among other science and religion scholars. Ayala, for example, exemplifies this very distinction when he explores the theological implications of biological evolution. He writes,

I shudder in terror at the thought that some people of faith would implicitly attribute [the calamity of the natural world] to the Creator’s faulty design. I rather see it as a consequence of the clumsy ways of the evolutionary process. The God of revelation and faith is a God of love and mercy, and of wisdom. Darwin’s theory of evolution is a gift to science, and to religion as well.<sup>36</sup>

This passage shows that evolution has theological implications for Ayala, but that does not imply evolution is unscientific. It only indicates that Ayala is pursuing two related, but distinct research programs. One is a scientific research program related to Darwinian evolution, and the other is a theological research program related to the theological implications of Darwinian evolution. Just as Ayala explores the relationship between Darwinism and theology, so Dembski explores the relationship between ID and theology. The similarities and differences between Ayala and Dembski make these theologians suitable dialogue partners.

### **Ayala’s Background**

Ayala was ordained as a Dominican priest in 1960 but resigned from the priesthood in the same year. In 1964, he graduated from Columbia University with a

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<sup>35</sup>Dembski, *The Design Revolution*, 25.

<sup>36</sup>Ayala, *Darwin’s Gift*, xi.

Ph.D. in biology, studying under the prominent geneticist and evolutionary biologist Theodosius Dobzhansky. Ayala is professor of biological sciences, philosophy, and logic at the University of California, Irvine. His research is grounded in evolutionary biology, and includes research on the origin and evolution of introns, as well as the evolution and functional significance of pseudogenes and ectopic expression. He has contributed to research projects focusing on gene organization, gene regulation, and the origin, function, and evolution of small RNAs, particularly in parasitic protozoa. In addition to his scientific research, Ayala has also contributed to scholarship in the philosophy of biology, the relationship between science and religion, and teaching evolution within public schools.

Ayala has published books devoted to evolutionary theory, notably *Human Evolution: Trails from the Past*, *Am I a Monkey? Six Big Questions about Evolution*, *The Big Questions: Evolution*, and most recently an edited work entitled, *Essential Readings in Evolutionary Biology*.<sup>37</sup> Closely related to the topic of evolution, he has also written two books in the area of science and religion, namely, *Darwin and Intelligent Design*<sup>38</sup> and *Darwin's Gift to Science and Religion*. A common theme throughout all of his works is that evolution is scientifically credible, it does not contradict religious belief, and that intelligent design is incompatible with both science and theology. In the prologue of *Darwin and Intelligent Design*, he writes,

There are many believers in the United States and elsewhere who think that science, and particularly the theory of evolution, is contrary to the teachings of the Bible and to religious beliefs, such as Creation by God. Science has demonstrated again and again, beyond reasonable doubt, that living organisms evolve and diversify over

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<sup>37</sup>Camilo Cela-Conde and Francisco J. Ayala, *Human Evolution: Trails from the Past* (Oxford: Oxford University Press, 2007); Francisco J. Ayala, *Am I a Monkey? Six Big Questions about Evolution* (Baltimore: The Johns Hopkins University Press, 2010); idem, *The Big Questions: Evolution*. London: Quercus, 2012; Francisco J. Ayala and John C. Avise, ed., *Essential Readings in Evolutionary Biology* (Baltimore: the Johns Hopkins University Press, 2014).

<sup>38</sup>Francisco J. Ayala, *Darwin and Intelligent Design* (Minneapolis: Fortress, 2006).

time, and that their features have come about by natural selection, a process that accounts for their design.<sup>39</sup>

The combination of Ayala's scientific and theological critiques of ID makes him particularly engaging when comparing him to Dembski.

### **Explanation of the Problem**

In *Darwin's Gift to Science and Religion*, Ayala expounds upon his approach to the problem of dysteleology in his introduction. He writes,

I assert that scientific knowledge, the theory of evolution in particular, is consistent with a religious belief in God, whereas Creationism and Intelligent Design are not. This point depends on a particular view of God - shared by many people of faith - as omniscient, omnipotent, and benevolent. This point also depends on our knowledge of the natural world and, particularly, of the living world. The natural world abounds in catastrophes, disasters, imperfections, dysfunctions, suffering, and cruelty. Tsunamis bring destruction and death; volcanic eruptions erased Pompeii and Herculaneum, killing all their citizens; floods and droughts bring ruin to farmers. The human jaw is poorly designed, lions devour their prey, malaria parasites kill millions of humans every year and make 500 million sick. I do not attribute all this misery, cruelty, and destruction to the specific design of the Creator. About 20 percent of all human pregnancies end in spontaneous abortions during the first two months. That is 20 million natural abortions every year. I shudder in terror at the thought that some people of faith would implicitly attribute this calamity to the Creator's faulty design.<sup>40</sup>

For Ayala, the existence of natural evil highlights an inconsistency between theism and ID. Again, he explains,

People of faith would do well to acknowledge Darwin's revolution and accept natural selection as the process that accounts for the design of organisms, as well as for the dysfunctions, oddities, and cruelties that pervade the world of life. Evolution makes it possible to attribute these mishaps to the natural processes (which have no moral implications) rather than to the direct creation of specific design of the Creator.<sup>41</sup>

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<sup>39</sup>Ayala, *Darwin and Intelligent Design*, vii.

<sup>40</sup>Ayala, *Darwin's Gift*, xi.

<sup>41</sup>Ayala, *Am I a Monkey?*, 78.

The overall argument here is simple, and it presents a direct challenge for theologians espousing ID. If examples of exquisite design highlight the intelligence of God, then examples of careless and cruel design should highlight the incompetence of God. Ayala insists upon theological consistency regarding this issue. To clarify the argument further, I offer the following formulation:

1. A God who is omniscient, omnipotent, and benevolent would not create organisms with suboptimal design [assumption].
2. There are organisms that display features of suboptimal design in biology [as discovered by modern science].
3. ID states that functional organisms were created by God [Ayala's definition of ID].
4. If functional organisms were created by God, then one should also assume that organisms displaying features of suboptimal design were also created by God [Ayala's assumed implication of 3].
5. ID states that God created organisms that display features of suboptimal design [3&4].
6. ID is inconsistent with a God who is omniscient, omnipotent, and benevolent [1 and 5].
7. On the other hand, the theory of evolution states that *all organisms* originated through purely natural processes [Ayala's definition of evolution].
8. If all organisms originated through purely natural processes, then organisms that display features of suboptimal design also originated through purely natural processes [logical implication of 7].
9. To state that organisms originated through purely natural processes implies that God did not create those organisms [clarification of 7 and 8].
10. The theory of evolution states that God did not create organisms that display features of suboptimal design [7, 8, and 9].
11. The theory of evolution is consistent with a God who is omniscient, omnipotent, and benevolent [1 and 10].
12. ∴ An omniscient, omnipotent, and omnibenevolent God is more consistent with evolution than with ID [6 and 11].

According to the argument above, examples of suboptimal design in nature seemingly provide defeaters for ID. By suboptimal design, I include any statement from Ayala that illustrates various kinds of natural evil—tsunamis, droughts, floods, etc.—design peculiarities—the backwards neural wiring of photoreceptors in the retina of human eye, the size of the female birth canal in humans, the panda’s thumb, etc.—suggested cruelty—predation, animal suffering, etc.—or simply the general wastefulness displayed in the processes of evolution—survival-of-the-fittest. While this problem is fairly straightforward, I should make two important clarifications. First, this dissertation presents a broad perspective on the problem of dysteleology, making it look almost indistinguishable from the problem of natural evil. The reason I do not call it the problem of natural evil is because the problem of natural evil is put forward as a defeater for Christian theism. Both Ayala and Dembski, however, agree that natural evil does not successfully undermine Christian theism. This means that the relevant problem is not the problem of natural evil, but the problem of dysteleology. According to the problem of dysteleology, as articulated in the argument above, suboptimal design provides a defeater for ID or any teleological conception of nature. Ayala agrees with this claim, whereas Dembski rejects it.

My second clarification refers to the scope of my thesis. Ayala argues that Darwin is a gift to theology precisely because Darwin discovered natural selection, an unguided mechanism that gets God off the hook for all examples of suboptimal design. My goal is not to analyze the merits of his evolutionary theodicy, nor is it to propose an alternative theodicy that is consistent with Christian theism. Rather, my goal is twofold. First, and more modestly, I seek to demonstrate that Ayala’s theological argument fails to undermine ID and a teleological conception of nature. Second, and more ambitiously, I seek to demonstrate that Ayala’s theodicy or any evolutionary theodicy requires a teleological conception of nature to avoid the trap of being self-referential-incoherent. Such an argument may seem counterintuitive at first, but the form of my argument is

similar to arguments that seek to demonstrate the self-defeating nature of maintaining that evolution and naturalism/materialism are both true.<sup>42</sup>

### **Methodology**

There are three methodological issues to mention regarding my approach to this project. First, I limit the scope of my research to the works of Dembski and Ayala. This limitation is necessary because one can find copious amounts of books and articles written on the topic of ID, with a history arguably dating back to Michael Denton's *Evolution: A Theory in Crisis* (1984).<sup>43</sup> To survey the entire corpus of ID literature, therefore, would require more time and research than is available for this dissertation.<sup>44</sup>

Second, I devote two chapters to explaining the scientific arguments for and against ID. Such attention may initially seem unwarranted, since Ayala's dysteleological argument is theological in nature. It will become apparent, however, that Ayala's theological critique of ID is rooted in his scientific understanding of ID and biological evolution. One cannot properly analyze his theological critique, therefore, without first examining his scientific argument for evolution and his scientific critique of ID. Likewise, Dembski's scientific work is also important, since it provides a basis for ascertaining whether Ayala's portrayal of ID accurately corresponds to ID *as articulated by its proponents*. If Ayala inaccurately represents the scientific program of ID, then the force of his theological critique will likely diminish.

The last methodological issue to consider is my process of evaluation. The first section of this dissertation considers Ayala's scientific and theological critiques of

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<sup>42</sup>For two examples, see Alvin Plantinga, *Where the Conflict Really Lies: Science, Religion, & Naturalism* (Oxford: Oxford University Press, 2011) and Thomas Nagel, *Mind & Cosmos: Why the Materialist Neo-Darwinian Conception of Nature is Almost Certainly False* (New York: Oxford University Press, 2012).

<sup>43</sup>Michael Denton, *Evolution: A Theory in Crisis* (Bethesda, MD: Adler & Adler, 1986).

<sup>44</sup>For details regarding the origin, history, and scope of modern ID arguments, see Thomas Woodward, *Doubts about Darwin: A History of Intelligent Design* (Grand Rapids: Baker, 2003).

ID. My goal in this section is to summarize, highlight, and analyze central points in Ayala's case against ID. In the second section, I articulate relevant aspects of Dembski's ID project to juxtapose his project against Ayala's critique of ID. This is where most of my assessment of these two thinkers takes place. After carefully comparing the arguments of Ayala and Dembski, I develop my central thesis in my concluding chapter, arguing that a teleological conception of nature is necessary to make any evolutionary theodicy logically coherent.

### Chapter Summaries

Chapter 2 includes a summary and explanation of Ayala's scientific critique of ID. His arguments against ID have five steps. First, he begins by narrating the history of Paley's watchmaker argument to Darwin's theory of evolution. Before *The Origin of Species* (1859), scientists and intellectuals generally believed that God created life. Ayala reports that such beliefs were respectable in the early nineteenth century because Paley's *Natural Theology* (1802) characterized the most promising science among contemporaries. Darwin, however, provided a new way of seeing the world. His greatest achievement, according to Ayala, was to show how complex organisms could arise through purely natural processes. The following three steps of Ayala's critique outlines the evidence for biological evolution and explains why Darwin's theory has endured over one hundred and fifty years and why reputable scientists no longer question its validity. His last step provides a direct scientific critique of ID.

Chapter 3 summarizes and explains Ayala's theological critique of ID. This critique centers on the problem of dysteleology. In short, Ayala argues that if *apparent* design provides adequate evidence for concluding *actual* design, then one should consistently argue that *apparent* suboptimal design provides adequate evidence for concluding *actual* suboptimal design. Such a conclusion, from Ayala's perspective, is problematic theologically because it undermines the goodness and wisdom of God.

Ayala argues, therefore, that ID is poor science and poor theology. Darwin, on the other hand, is a gift for the theologian, since Darwin's great accomplishment was to demonstrate how life could arise without divine intervention. This means that God is not responsible for suboptimal design, rather suboptimal design is the result of undirected processes expressed through random mutation and natural selection.

Chapter 4 summarizes and explains Dembski's method for detecting design. The first section covers his fundamental argument in *The Design Inference*, specifically concentrating on his Explanatory Filter, the concept of specified complexity, and his criteria for detecting agency. Section two provides an overview of *No Free Lunch*, which applies Dembski's idea of specified complexity to biology. Throughout this chapter, I compare Dembski's arguments with Ayala's and argue that the fundamental difference between the two centers on one's ability to detect teleology in nature. Ayala argues that the concept of teleology was undermined by Darwin's theory, and design is therefore not detectable. Dembski, on the other hand, argues that teleology is real and detectable in biology.

Chapter 5 summarizes and explains Dembski's metaphysical commitments. I draw upon Dembski's various philosophical and theological writings but give special attention to his most recent book, *Being as Communion*. I highlight that Dembski's main theological contribution centers on the idea that prime reality consists of information, rather than unthinking material atoms. Dembski's information-theoretic conception of nature is purely metaphysical, but it underscores a crucial issue for this dissertation. If design cannot be detected in nature because the natural world is reduced to material substances, then it seems to suggest that any examples of teleology (including human inventions) are ultimately reduced to non-teleological matter. Dembski argues that this position is self-defeating, and should be replaced with an information-theoretic perspective on reality.

Chapter 6 concludes with a final analysis of Ayala's theological critique of ID, along with an argument for the necessity of teleology. I first demonstrate that Ayala is unsuccessful in undermining Dembski's articulation of ID, thus showing that the problem of dysteleology does not provide a defeater for ID or a teleological conception of nature. I then propose that teleology is necessary for developing a coherent evolutionary theodicy. This proposal may seem counterintuitive for many advocates of evolutionary theodicy; however, my argument is related to other arguments that seek to demonstrate the inconsistency between naturalism and evolution.

## CHAPTER 2

### AYALA'S SCIENTIFIC CRITIQUE OF ID

Ayala claims there are two fundamental problems with ID. The first problem is that ID lacks scientific cogency, and the second is that it lacks religious merit by ascribing unacceptable characteristics to God.<sup>1</sup> This chapter critically examines and evaluates Ayala's former contention, that ID lacks scientific cogency. He defends this thesis repeatedly throughout various books and articles, and the outline of his argument appears to follow five steps.<sup>2</sup> First, he contends that the design argument was stated most persuasively in Paley's *Natural Theology* in 1802, but that it was later overturned by Darwin in *The Origin of Species* in 1859. Ayala recounts the history of Paley to Darwin in detail, providing charitable explanations of each thinker's arguments. Ayala's second step is to demonstrate that modern scientific discoveries have firmly established Darwin's theory. Step three presents the case for human evolution. Steps four and five provide more direct critiques of ID. Step four elucidates how natural selection has the power to create organisms that appear designed for a purpose, while step five seeks to demonstrate how various arguments offered by ID advocates fail to appreciate the explanatory power of Darwin's natural selection.

My main goal in this chapter is to explain each step of Ayala's scientific critique of ID, although there are several places where I also provide a brief analysis of

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<sup>1</sup>Francisco J. Ayala, *Darwin's Gift to Science and Religion* (Washington, DC: Joseph Henry, 2009), 135.

<sup>2</sup>While I draw on various sources from Ayala in this chap., the five steps I mention represent differing chapters in his book *Darwin and Intelligent Design* (Minneapolis: Fortress, 2006). I am not sure whether Ayala views each chapter as a building case against ID, or whether he has two projects in mind (one a case for evolution, and one a case against ID). Either way, Ayala certainly presents ID as an idea in conflict with biological evolution, and therefore evidence for evolution is presumably evidence against ID.

his arguments. Most of this analysis compares Ayala's arguments with counterarguments offered in Dembski's textbook on ID, *The Design of Life* (coauthored with Jonathan Wells), though I utilize other sources as well.<sup>3</sup> The reason I provide these counterarguments is simply to show that ID advocates are familiar with the various lines of evidence offered by Ayala, and that they are also familiar with his critiques of ID.<sup>4</sup> Whether Dembski's counterarguments are successful is a topic for qualified scientists to address.

### **William Paley to Charles Darwin**

Ayala begins his evaluation of ID by providing a historical analysis regarding the demise of teleological explanations in science. He focuses specifically on the history leading up to Darwin's famous discovery of natural selection. Before Darwin, William Paley's watchmaker argument was the most respected and sophisticated version of the design argument to date. The modern ID movement, according to Ayala, is nothing more than a revival of Paley.<sup>5</sup> He concedes that the design argument was persuasive in the early 1800's, but since Darwin, educated thinkers presumably recognize that design explanations are no longer appropriate in science. Ayala assures his readers that no thinker before or since Paley has produced a more compelling version of the design

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<sup>3</sup>William A. Dembski and Jonathan Wells, *The Design of Life: Discovering Signs of Intelligence in Biological Systems* (Richardson, TX: The Foundation for Thought and Ethics, 2008).

<sup>4</sup>ID advocates frequently face critics who think that proponents of ID are simply uninformed. Richard Dawkins, for example, famously asserted, "It is absolutely safe to say that if you meet somebody who claims not to believe in evolution, that person is ignorant, stupid or insane (or wicked, but I'd rather not consider that)." Richard Dawkins, "Put Your Money on Evolution," *The New York Times Review of Books*, April 9, 1989, 34-35.

<sup>5</sup>Dembski disagrees with Ayala on this point. He writes, "Paley's business was natural theology. Intelligent design's business is much more modest: it seeks to identify signs of intelligence to generate scientific insights. Thus, instead of looking to signs of intelligence to obtain theological mileage, as Paley did, intelligent design treats signs of intelligence as strictly part of science." William A. Dembski, *The Design Revolution: Answering the Toughest Questions about Intelligent Design* (Downers Grove, IL: InterVarsity, 2004), 64.

argument, and because of that, there is little need to investigate the merits of modern ID argumentation.<sup>6</sup> If one refutes Paley, then supposedly one refutes ID.

To appreciate the connection between Paley and the modern ID movement, Ayala provides details of the history leading up to Paley, as well as the details of Paley's design argument. He notes that Paley's monumental work, *Natural Theology*, builds upon several earlier works, most notably John Ray's *Wisdom of God Manifested in the Works of the Creation* (1691).<sup>7</sup> Paley builds on Ray's work by providing meticulous details regarding the complexities of mammalian eyes, the precise mechanical arrangement of bones, cartilage and joints, as well as the circulation of blood and the disposition of blood vessels.<sup>8</sup> His scientific knowledge, recognized by Ayala, went well beyond the majority of Paley's contemporaries. Students of philosophy who are first

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<sup>6</sup>Ayala, *Darwin and Intelligent Design*, 3. Elsewhere, Ayala writes that Paley's natural theology was a "brilliant exposition of the argument-from-design, the most articulate and biologically expert case made to date for the existence of the Creator, elicited from the complex functional design of organisms." Francisco J. Ayala, "From Paley to Darwin: Design to Natural Selection," in *Back to Darwin: A Richer Account of Evolution*, ed. John Cobb Jr. (Grand Rapids: Eerdmans, 2008), 50. Ayala further argues that Paley developed the case for design with "greater cogency and more extensive knowledge of biological detail than had any other author, before or since" (ibid., 58). I will demonstrate in chap. 4 that Ayala misunderstands the nuances between Paley's *Natural Theology* and modern versions of ID.

<sup>7</sup>John Ray, *The Wisdom of God Manifested in the Works of Creation: In Two Parts* (1691).

<sup>8</sup>Francisco J. Ayala, "Darwin and Intelligent Design," in vol. 2 of *Science and Religion in Dialogue*, ed. Melville Steward (Malden, MA: Blackwell, 2010), 752-53. Ayala writes, "Paley was not the only proponent of the argument from design in Britain in the first half of the nineteenth century. A few years after the publication of *Natural Theology*, the eighth Earl of Bridgewater endowed the publication of treatises that would set forth 'the Power, Wisdom and Goodness of God as manifested in the Creation.' Eight treatises were published during 1833-40, several of which artfully incorporate the best science of the time and had considerable influence on the public and among scientists. William Buckland, professor of geology at Oxford University, notes in *Geology and Mineralogy* (1836) the world distribution of coal and mineral ores and proceeds to point out that they had been deposited in a remote part, yet obviously with the forethought of serving the larger human populations that would come about much later. Another geologist, Hugh Miller in *The Testimony of the Rocks* (1858), would argue that it is not only the perfection of design but also the beauty of natural structures found in rock formations and in mountains and rivers that manifests the intervention of the Creator" (ibid., 753). Elsewhere Ayala notes other thinkers who embraced or promoted design arguments shortly before Paley, such as Henry More (1614-1687), Robert Hooke (1635-1703), Thomas Burnet (1635-1703), Bernard Nieuwentijt (1654-1718), and even François Marie Arouet de Voltaire (1694-1778). Henry More, for example, argued that the succession of day and night provides a sign of divine design. Francisco J. Ayala, "There Is No Place for Intelligent Design in the Philosophy of Biology: Intelligent Design Is Not Science," in *Contemporary Debates in Philosophy of Biology*, ed. Francisco Ayala and Robert Arp (Malden, MA: Blackwell, 2010), 367.

introduced to Paley's watchmaker argument often overlook this point. This is because Paley is primarily known only for his first chapter in *Natural Theology*, where he writes,

In crossing a heath, suppose I pitched my foot against a *stone*, and were asked how the stone came to be there, I might possibly answer, that, for any thing I knew to the contrary, it had lain there for ever: nor would it perhaps be very easy to show the absurdity of this answer. But suppose I had found a *watch* upon the ground, and it should be enquired how the watch happened to be in that place, I should hardly think of the answer which I had before given, that, for any thing I knew, the watch might have always been there.<sup>9</sup>

This famous passage provides a simple introduction to the teleological argument, and most readers intuitively recognize the distinction between a *stone* and a *watch*. Paley explains this intuition by emphasizing that we perceive in the watch "several parts [that] are framed and put together for a purpose."<sup>10</sup> The stone, however, has no such arrangements.

Paley's watchmaker analogy is straightforward, but Ayala stresses that Paley developed his argument further with elaborate examples and sophisticated arguments in *Natural Theology*.<sup>11</sup> The paragraph below provides just one example, showing how Paley built his case for design by comparing an eye to a telescope. Paley explains,

I know no better method of introducing so large a subject, than that of comparing a single thing with a single thing; an eye, for example, with a telescope. As far as the examination of the instrument goes, there is precisely the same proof that the eye was made for vision, as there is that the telescope was made for assisting it. They are made upon the same principles; both being adjusted to the laws by which the transmission and refraction of rays of light are regulated. . . . For instance, these laws require, in order to produce the same effect, that the rays of light, in passing from water into the eye, should be refracted by a more convex surface than when it passes out of air into the eye. Accordingly we find that the eye of a fish, in that part of it called the crystalline lens, is much rounder than the eye of terrestrial animals. What plainer manifestation of design can there be than this difference? What could a mathematical instrument maker have done more to

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<sup>9</sup>William Paley, *Natural Theology* (Oxford: Oxford University Press, 1802), 7.

<sup>10</sup>Ibid.

<sup>11</sup>To demonstrate the force of Paley's argument, Ayala provides several lengthy passages of Paley's *Natural Theology*. See Ayala, "From Paley to Darwin," 59-62.

show his knowledge of this principle, his application of that knowledge, his suiting of his means to his end . . . to testify counsel, choice, consideration, [and] purpose?<sup>12</sup>

In this passage, Paley notes the differences between the eyes of terrestrial animals and the eyes of a fish. He reasons that these differences clearly manifest design, since there is a seemingly inexplicable correlation between how terrestrial eyes and fish eyes are each suited for their respective environments.

Paley additionally develops principles to explain how the intuition of design can be articulated to further appreciate the force of the argument. To do this, he compares the creative powers of *chance* with the creative powers of *design*:

What does chance ever do for us? In the human body, for instance, chance, that is, the operation of causes without design, may produce a wen, a wart, a mole, a pimple, but never an eye. Among inanimate substances, a clod, a pebble, a liquid drop might be; but never was a watch, a telescope, an organized body of any kind, answering a valuable purpose by a complicated mechanism, the effect of chance. In no assignable instance has such a thing existed without intention somewhere.<sup>13</sup>

*Chance*, for Paley, is an “operation of causes without design.” It has the power to produce wens, warts, moles, and pimples, but such features have no recognizable purpose. An eye, however, does have a recognizable purpose. Eyes are designed for sight. Warts are not designed for anything. These distinctions are clear for Paley.

Elsewhere, he explains,

When several different parts contribute to one effect, or, which is the same thing, when an effect is produced by the joint action of different instruments, the fitness of such parts or instruments to one another for the purpose of producing, by their united action, the effect, is what I call relation; and whatever this is observed in the works of nature or of man, it appears to me to carry along with it decisive evidence of understanding, intention, art... all depending upon the motions within, all upon the system of intermediate actions.<sup>14</sup>

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<sup>12</sup>Paley, *Natural Theology*, 16.

<sup>13</sup>Ibid., 38.

<sup>14</sup>Ibid., 140.

Ayala highlights this passage in one of his articles, and then draws a parallel between what he calls “Paley’s relation argument” and Michael Behe’s argument for irreducible complexity (IC).<sup>15</sup> He concedes that the argument is persuasive and understands why Paley’s contemporaries would find it irrefutable.<sup>16</sup> He is perplexed, however, that a modern biochemist would promote the same kind of argument.

After Darwin published *The Origin of Species*, Ayala argues that teleological explanations became irrelevant for science.<sup>17</sup> He notes that while Darwin was initially impressed with Paley’s various examples of design, it was Darwin’s great accomplishment to provide a “scientific explanation of that design.”<sup>18</sup> Darwin did this by presumably demonstrating that natural selection working on variations within organisms has the power to create seemingly designed features. Such design, however, is not intelligent design but natural design. Ayala explains, “Darwin accepted that organisms are ‘designed’ for certain purposes; that is, they are functionally organized. Organisms are adapted to certain ways of life and their parts are designed to perform certain functions. Birds have wings for flying, fish have gills to breathe in water and trees have

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<sup>15</sup>Ayala, “From Paley to Darwin,” 61.

<sup>16</sup>Ayala notes that Darwin himself was impressed by Paley’s argument. In a letter written to John Lubbock, Darwin states, “I do not think I ever admired a book more than Paley’s *Natural Theology*: I could almost formerly have said it by heart.” Charles Darwin, *On the Origin of Species* (Oxford: Oxford University Press, 1859), xxxi-xxxii.

<sup>17</sup>Ayala argues that the motivating objective of Darwin’s *Origin of Species* “was to provide a solution to Paley’s problem; namely, to demonstrate how his discovery of natural selection would account for the design of organisms, without the need to resort to supernatural agencies.” Ayala, “From Paley to Darwin,” 67.

<sup>18</sup>Francisco J. Ayala, *The Big Questions: Evolution* (London: Quercus, 2012), 47. Scientific explanations for Ayala are non-teleological explanations.

leaves to capture the sunlight.”<sup>19</sup> For Ayala, Darwin demonstrated that *functional* design does not always entail *actual* design. He argues this point, even when considering Paley’s detailed descriptions of mammalian eyes. Such examples may pose problems for simple intuition; however, Darwin reasoned that gradual changes that accumulate over time would eventually produce such complexities. Darwin explains,

To suppose that the eye, with all its inimitable contrivances for adjusting the focus to different distances, for admitting different amounts of light, and for the correction of spherical and chromatic aberration, could have been formed by natural selection, seems, I freely confess, absurd in the highest possible degree. Yet reason tells me, that if numerous gradations from a perfect and complex eye to one very imperfect and simple, each grade being useful to its possessor, can be shown to exist; if further, the eye does vary ever so slightly, and the variations be inherited, which is certainly the case; and if any variation or modification in the organ be ever useful to an animal under changing conditions of life, then the difficulty of believing that a perfect and complex eye could be formed by natural selection, though insuperable by our imagination, can hardly be considered real.<sup>20</sup>

Ayala argues that Darwin’s aforementioned insights provided a new way of thinking about cause and effect in the natural world. He demonstrated, according to Ayala, that Paley’s fatal flaw was his failure to consider the creative force of combining two purely naturalistic mechanisms (*chance variations* coupled with *natural selection*). When it came to explaining the complexity of eyes, therefore, Paley mistakenly placed *chance* against *design* as the only two modes of explanation. If natural selection is applied to *chance* variations, however, then there is a greater capacity for increased complexity, and

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<sup>19</sup>Ayala, *The Big Questions*, 16.

<sup>20</sup>Darwin, *Origin of Species*, 140. Darwin further writes, “It is scarcely possible to avoid comparing the eye to a telescope. We know that this instrument has been perfected by the long continued efforts of the highest human intellects; and we naturally infer that the eye has been formed by a somewhat analogous process. But may not this inference be presumptuous? Have we any right to assume that the Creator works by intellectual power like those of man? If we must compare the eye to an optical instrument, we ought in imagination to take a thick layer of transparent tissue, with a nerve sensitive to light beneath, and then suppose every part of this layer to be continually changing slowly in density, so as to separate into layers of different densities and thicknesses, placed at different distances from each other, and with the surfaces of each layer slowly changing in form” (ibid., 141).

thus the design of the eye is more explicable from a purely naturalistic perspective.<sup>21</sup>

Ayala claims that this insight overturned the design argument, and it has not recovered since Darwin.

### **The General Case for Evolution**

Given Darwin's insights mentioned above, Ayala finds it astonishing that modern thinkers still promote ideas like ID and question the validity of biological evolution. He assumes this happens because the public is, broadly speaking, scientifically illiterate. For this reason, he assures his general readers that the evidence for evolution has been so substantiated that professional scientists no longer debate whether it happened. He writes, "scientists agree that the evolutionary origin of animals and plants is a scientific conclusion beyond reasonable doubt. They place it beside such established concepts as the roundness of the Earth, its rotation around the Sun, and the molecular composition of matter."<sup>22</sup> Debates surrounding the evidence and arguments for ID and evolution, therefore, do not happen within the scientific community according to Ayala. Biologists consider evolution a fact. They may participate in debates regarding *how* evolution happened, but they do not dispute *that* evolution happened.<sup>23</sup>

Ayala's confidence brings up important questions regarding the definition of evolution. He obviously finds the evidence for evolution overwhelming, but what precisely does he mean by evolution? In several places, he refers to his understanding of

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<sup>21</sup>Many think that Darwin's main contribution to science was the discovery of evolution. This is not entirely true, since one can trace evolutionary ideas back to the pre-Socratic philosophers of ancient Greece. Anaximander and Empedocles, for example, both proposed ideas that loosely resemble modern evolutionary ideas. Ayala notes, "Contrary to popular opinion, neither the term nor the idea of biological evolution began with Charles Darwin and his foremost work *On the Origin of Species by Means of Natural Selection*." Francisco J. Ayala, "The Evolution of Life: An Overview," in *God and Evolution: A Reader*, ed. Mary K. Cunningham (New York: Routledge, 2007), 59.

<sup>22</sup>Ayala, "Darwin and Intelligent Design," 760.

<sup>23</sup>Ayala, *The Big Questions*, 17.

evolution as “the modern theory of evolution, or the synthetic theory of evolution.”<sup>24</sup> By this, he means a theory of evolution that combines Mendelian genetics with Darwinian natural selection. This theory promotes three basic ideas:<sup>25</sup>

1. Hereditary variations occur, some more favorable than others to the organisms.
2. More organisms are produced than can possibly survive and reproduce.
3. Organisms with more favorable variations will survive and reproduce more successfully.

Ayala asserts that two consequences follow from these three ideas. The first consequence is that organisms that adapt to their environment will have a higher chance of living and reproducing. This consequence is both obvious and well documented within the natural world. The second consequence is that changes will occur and build on each other over time. Again, this consequence is obvious and well documented in the natural world. If one understands these three ideas, followed by the two consequences, then one understands the modern theory of biological evolution. Ayala finds it surprising that such a simple and obvious idea could be so controversial.

Of course, Ayala’s simple portrayal of evolution deemphasizes aspects of evolution that makes it controversial. He is certainly right to describe the synthetic theory of evolution as descent with modification. But he also knows that evolution is a far more expansive theory, which includes the additional notion all organisms “are related by descent from common ancestors.”<sup>26</sup> This more expansive claim is significantly different than descent with modification. Even so, Ayala maintains that common ancestry is just as established as descent with modification. When referring to common

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<sup>24</sup>Ayala, “The Evolution of Life,” 65.

<sup>25</sup>Camilo Cela-Conde and Francisco J. Ayala, *Human Evolution: Trails from the Past* (Oxford: Oxford University Press, 2007), 1-4.

<sup>26</sup>Francisco J. Ayala, *Am I a Monkey? Six Big Questions about Evolution* (Baltimore: The Johns Hopkins University Press, 2010), 18.

ancestry, though, he does make distinctions regarding the *fact of evolution*, the *history of evolution*, and the *mechanisms of evolution*.<sup>27</sup> The *fact of evolution* simply states that all organisms do share a common ancestor. This statement, according to Ayala, is not controversial among scientists. He does acknowledge, though, that the *history of evolution* and the *mechanisms of evolution* do evoke legitimate debates and are therefore “matters of active scientific investigation.”<sup>28</sup> When Ayala references the *history of evolution*, he is referring to disagreements regarding when lineages split from one another. When he refers to the *mechanism of evolution*, he refers to scientific debates concerning the precise processes that drive evolutionary development.<sup>29</sup> While the *history of evolution* and the *mechanism of evolution* evoke debate, Ayala stresses that

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<sup>27</sup>Ayala, *Am I a Monkey?*, 20. Ayala’s threefold definition of evolution corresponds to Dembski and Wells’s twofold definition of evolution. They explain that evolution is “a claim about natural history and is known as ‘common descent’ or ‘universal common ancestry.’ According to it, there is a common ancestor to which all living organisms trace their lineage. [They also] assert that evolutionary change proceeds by purely material mechanisms and thus requires no intelligent guidance. Intelligence, on this view, is a product of evolution rather than something that guides it.” Dembski and Wells, *The Design of Life*, xxi. Elsewhere, Dembski writes, “Evolution can be construed as a fully naturalistic, purposeless process that by means of natural selection and mutation has produced all living things. On the other hand, evolution can mean nothing more than organisms have changed over time (leaving the extent and mechanisms of change unspecified).” William A. Dembski, “What Every Theologian Should Know about Creation, Evolution & Design,” in *Unapologetic Apologetics: Meeting the Challenges of Theological Studies*, ed. William Dembski and Jay Wesley Richards (Downers Grove, IL: InterVarsity, 2001), 232. Alvin Plantinga offers yet a more detailed definition of evolution. He mentions that the term frequently refers to six distinct claims: (1) the *ancient earth thesis*, or the claim that the earth is 4.5 billion years old; (2) it can refer to the *progress thesis*, the claim that life has progressed from relatively simple to relatively complex forms; (3) it can refer to *descent with modification*. This is the claim that the “enormous diversity of the contemporary living world has come about by way of offspring differing, ordinarily in small and subtle ways, from their parents”; (4) it can refer to the *common ancestry thesis*, which states that life originated at only one place on earth, and all subsequent life is related by descent to those original living creatures; (5) it can refer to *Darwinism*, which for Plantinga is the claim that there is a naturalistic mechanism driving the process of descent with modification; and (6) it can refer to the *naturalistic origins thesis*. This is the idea that “life itself developed from non-living matter without any special creative activity of God but just by virtue of processes described by the ordinary laws of physics and chemistry.” Alvin Plantinga, *Where the Conflict Really Lies: Science, Religion, & Naturalism* (Oxford: Oxford University Press, 2011), 8-10.

<sup>28</sup>Ayala, *Am I a Monkey?*, 21.

<sup>29</sup>These processes include random mutation and natural selection, and proposals such as population genetics, genetic drift, evolutionary development (often called evo-devo), gene flow, punctuated equilibrium, etc.

such debates do not undermine the *fact of evolution*.<sup>30</sup> His first task in undermining ID, then, is to demonstrate the *fact of evolution*.<sup>31</sup>

Ayala begins this task by explaining the fossil record and biogeography for his readers. He claims that the fossil record demonstrates that life evolved in a haphazard fashion, rather than in an orderly or designed fashion. He explains,

The radiations of some groups of organisms, the numerical and territorial expansions of other groups, the replacement of some kinds of organisms by other kinds, the occasional but irregular occurrence of trends toward increased size or other sorts of chance, and the ever-present extinctions are best explained by natural selection of organisms subject to the vagaries of genetic mutation, environmental challenge, and past history. The scientific account of these events does not necessitate recourse to a preordained plan, whether imprinted from the beginning or through successive interventions by an omniscient and almighty Designer. Biological evolution differs from a painting or an artifact in that it is not the outcome of preconceived design. The design of organisms is not intelligent, but imperfect and, at times, outright dysfunctional.<sup>32</sup>

For Ayala, the fossil record both confirms *the fact of evolution* and disconfirms the argument for design. The reality of extinction and the replacement of some kinds of organisms by other kinds presumably suggest that life is not the result of a preordained plan.

By initially highlighting imperfections within the fossil record, Ayala reframes the supposed problem of the fossil record promoted by evolutionary critics. Critics of evolution often claim that a close examination of the fossil record demonstrates that there

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<sup>30</sup>He writes, “It seems unlikely that theories as extensively corroborated by contributions from so many disciplines as the evolution of organisms will ever be rejected or replaced. Surely, however, the theory of evolution will be further developed and advanced.” Ibid., 24. He further references the fact that the overwhelming majority of biologists embrace evolution, and notes that the evidence “no longer engages the interest of biologists except when explaining evolution to the public or arguing with those who refuse to accept evolution” (ibid., 49-50).

<sup>31</sup>In the body of this chap., I demonstrate that the evidence for common ancestry is irrelevant when it comes to the debate over ID. While ID advocates are split regarding whether all life originated from a common ancestor, they all agree that the cogency of ID is not contingent upon the question of common ancestry.

<sup>32</sup>Ayala, “There is No Place,” 382.

is a lack of transitional fossils. Darwin himself noted this problem in *The Origin of Species* when he wrote, “Why, if species have descended from other species by insensible fine gradations, do we not everywhere see innumerable transitional forms?”<sup>33</sup> Dembski and Wells emphasize this passage and provide a recent example of this critique in *The Design of Life*. They explain,

To his credit, Darwin acknowledged that this absence of transitional forms created a serious problem for his theory. Nonetheless, despite this acknowledgement, many scientists continued to find his case for evolution compelling. Perhaps, they reasoned, the missing transitional fossils would eventually be found. In Darwin’s day, fossil findings were patchy and the search itself was unsystematic. Darwin himself hoped that the missing transitional forms would turn up as scientists searched more deliberately and systematically. Thus began the search for “missing links.” What did paleontologists find? Many new fossils, to be sure. But what they didn’t find were the numerous intermediates that, according to Darwin’s theory, had once existed.<sup>34</sup>

Contra Dembski and Wells, Ayala claims that intermediates are now abundant and that the fossil record clearly shows an evolutionary progression of life. Ayala provides an overview of this evidence, beginning with the earliest known fossils, which can be dated to 3.4 billion years old. These early fossils, he explains, are simple and resemble microorganisms such as bacteria.<sup>35</sup> After simple prokaryotic cells appear in the fossil record, one finds eukaryotic cells dating approximately to 2.0 billion years old. This shows a progression from simple life to complex life as time progresses. Ayala explains that this progression continues as one examines the fossil evidence. He writes,

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<sup>33</sup>Darwin, *Origin of Species*, 129. Of course, Darwin provided a response to this question and devoted a whole chapter to explaining the lack of evidence. He writes, “I believe the answer mainly lies in the record being incomparably less perfect than is generally supposed; the imperfection of the record being chiefly due to organic being not inhabiting profound depths of the sea, and to their remains being embedded and preserved to a future age only in masses of sediment sufficiently thick and extensive to withstand an enormous amount of future degradation; and such fossiliferous masses can be accumulated only where much sediment is deposited on the shallow bed of the sea, whilst it slowly subsides” (ibid., 130). Since Darwin, paleontologists have amassed a numerous fossils that allegedly confirm Darwin’s theory. I discuss the more noteworthy discoveries later in this section.

<sup>34</sup>Dembski and Wells, *The Design of Life*, 61-62.

<sup>35</sup>Ayala, *The Big Questions*, 121.

The oldest known animal fossils, nearly 700 million years old, come from the Ediacara fauna, small wormlike creatures with soft bodies. Numerous fossils belonging to many animal phyla and exhibiting mineralized skeletons appear in rocks about 540 million years old, during the geological period known as the Cambrian. (A phylum, plural phyla, is a major group of organisms, such as the molluscs or the chordates.) These organisms are different from those living now and from those living at intervening times. Some are so radically different that paleontologists have had to create new phyla in order to classify them. The first vertebrates (phylum Chordata, or chordates) appeared more than 400 million years ago; the first mammals less than 200 million years ago. The history of life recorded by fossils presents compelling evidence of evolution.<sup>36</sup>

To provide a visual of this progression, Ayala provides the following list:<sup>37</sup>

Table 1. Fossil sequences

LIFE FORM	MILLIONS OF YEARS SINCE FIRST KNOWN APPEARANCE
Microbial (prokaryotic cells)	3,500
Complex (eukaryotic cells)	1,400-2,000
First multicellular animals	670
Shell-bearing animals	540
Vertebrates (simple fishes)	490
Amphibians	350
Reptiles	310
Mammals	200
Non-human primates	60
Earliest apes	25
Australopithecine ancestors	5
Homo sapiens (modern humans)	0.15 (150,000 years)

<sup>36</sup>Ayala, *The Big Questions*, 121.

<sup>37</sup>Ibid., 122.

Referring to this chart, Ayala explains that the particular order of the fossil record demonstrates common ancestry. And if common ancestry is accepted, he further explains that one can make predictions regarding future paleontological discoveries. For example, amphibians will likely never appear before fish, mammals will never appear before reptiles, and complex life will never appear before the oldest eukaryotic cells.<sup>38</sup> These predictions are repeatedly confirmed, and thus Ayala insists that common ancestry is the most plausible interpretation of the fossil record.<sup>39</sup>

After explaining the basic order of the fossil record, Ayala shifts to the problem of transitional fossils. As mentioned above, Ayala disagrees with Dembski and Wells regarding the evidence for transitional fossils. He claims there are intermediate fossils between fish and amphibians, amphibians and reptiles, and between reptiles and mammals. These fossils, for Ayala, are so numerous that it is “often difficult to identify categorically where the transition occurs from one to another particular genus or from one to another particular species.”<sup>40</sup> He focuses particularly on two alleged intermediates that often receive media attention, namely, *Archaeopteryx* and *Tiktaalik*. *Archaeopteryx* is commonly recognized as an intermediate between reptiles and birds.<sup>41</sup> Paleontologists

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<sup>38</sup>Ayala, *The Big Questions*, 123.

<sup>39</sup>Ayala briefly considers the notion that all the fossils were deposited in a worldwide flood, as proposed by young earth creationists. Concerning this idea, he writes, “There is clear evidence in the form of inter-tidal and terrestrial deposits that at no recorded time in the past has the entire planet been under water. Moreover, a universal flood of sufficient magnitude to deposit the existing strata, which together are many scores of kilometres thick, would require a volume of water far greater than has ever existed on and in the Earth, at least since the formation of the first known solid crust about four billion years ago. The belief that all this sediment with its fossils was deposited in an orderly sequence in only a year defies all geological observations and physical principles. There were periods of unusually high rainfall, and extensive flooding of inhabited areas has occurred, but there is no scientific support for the hypothesis of a universal mountain-topping flooding” (ibid., 123).

<sup>40</sup>Ibid., 122.

<sup>41</sup>Dembski and Wells consider the case of *Archaeopteryx* in *The Design of Life*, and are not convinced that it represents a compelling transitional form. They write, “The feathers in *Archaeopteryx* appear to be identical to those in modern birds, having the structure of a genuine airfoil. Yet, in place of the standard adaptational package characteristic of birds, *Archaeopteryx* has several reptilian features, including a bony tail, teeth in its beak and claws on its wings. The case of the duck-billed platypus is

regularly highlight that *Archaeopteryx*'s skeleton is reptile-like, and yet the fossils indicates that it also had feathers. The skull of *Archaeopteryx* is bird-like with an expanded braincase, large eye sockets, a pronounced beak, teeth (unlike modern birds), and may have been capable of flying.<sup>42</sup>

Ayala also mentions *Tiktaalik*. This fossil was recently discovered in 2004, and first published in 2006. The *Tiktaalik* fossil is commonly recognized as an intermediate between fish and tetrapods, and Ayala describes it as a flattened, superficially crocodile-like animal. He continues his description:

[*Tiktaalik*'s] fish-like features include small pelvic fins, fin rays rather than digits in their paired appendages, and well-developed gill arches, which suggest that they remained mostly aquatic. But the bony gill cover has disappeared, indicating reduced water flow through the gill chamber. The elongated snout suggests a shift from sucking toward snapping up prey, mostly on land. The relatively large ribs indicate that *Tiktaalik* could support its body out of water.<sup>43</sup>

Before the *Tiktaalik* discovery, Ayala notes that *Panderichthys* was the closest known fish fossil to the tetrapods. The earliest known tetrapod fossils were *Ichthyostega* and *Acanthostega*.<sup>44</sup> As science progresses, consequently, Ayala suspects that the purported gaps will continue to close.

*Archaeopteryx* and *Tiktaalik* are undoubtedly important fossils to examine, but even if they are appropriately classified as transitional fossils, do they present a challenge

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similar. The platypus lays eggs and has a bill like a duck. But except for these bird-like features, it is like other mammals in possessing fur and suckling its young. Taxonomists classify it as a mammal, and it has never been considered a transitional form between birds and mammals. Most proposed missing links are like this – rather than merging taxonomic groups, they fall almost exclusively in one group or another.” Dembski and Wells, *The Design of Life*, 62.

<sup>42</sup>Ayala, *Darwin and Intelligent Design*, 33. Ayala notes that the first *Archaeopteryx* fossil was discovered in Bavaria in 1861, and since then there have been many *Archaeopteryx* discoveries (the most recent discovery appeared in December 2005).

<sup>43</sup>Ibid., 32.

<sup>44</sup>Ayala, *The Big Questions*, 126. Interestingly, Dembski and Wells do not consider *Tiktaalik* in *The Design of Life*. This is strange since *The Design of Life* was published in 2009 and the discovery of *Tiktaalik* was published in 2006.

to ID? The short answer is no. This does not mean, however, that ID advocates will acknowledge them as fossil intermediates. In *The Design of Life*, Dembski and Wells offer several critiques of alleged transitional fossils. They claim that most proposed intermediates fall almost exclusively into one taxonomical group or another, but never as true intermediates.<sup>45</sup> They further insist that gaps in the fossil record persist, and that Darwinian advocates rarely consider alternative (teleological) interpretations of the available evidence. Broadly speaking, Dembski and Wells offer four possible interpretations that account for the purported gaps, namely:<sup>46</sup>

1. The Imperfect Record Interpretation. The gaps result from imperfections in the fossil record. Only a small fraction of the organisms that lived in the past have been preserved as fossils. It is therefore unlikely that future research will fill in the gaps. Support for the theory of evolution must look beyond the fossil record.
2. The Insufficient Search Interpretation. The gaps result from a failure to examine the fossil-bearing strata thoroughly enough. The gaps will close as a more complete sampling of fossils is taken.
3. The Punctuated Equilibrium Interpretation. The gaps result from evolution being a saltational or “jerky” process. Darwin was wrong about evolution being smooth and gradual. Evolution happens rapidly in small, isolated populations, punctuating an otherwise stagnant equilibrium. Although transitional forms must have existed, few, if any, get preserved.
4. The Abrupt Emergence Interpretation. The gaps are real and reflect fundamental discontinuities in nature. Basic groups of organisms emerged suddenly. Transitional forms connecting these basic groups never existed.

According to Dembski and Wells, the fourth option (abrupt emergence) is the face-value interpretation of the available evidence.<sup>47</sup> The first three options, they explain, are justified more by methodological naturalism (MN), a philosophical position, than by the

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<sup>45</sup>Dembski and Wells, *The Design of Life*, 62.

<sup>46</sup>Ibid., 69.

<sup>47</sup>Ibid., 77.

actual fossil evidence. And since they reject MN, they maintain that abrupt emergence is the more plausible interpretation of the data.<sup>48</sup>

The next line of evidence for common ancestry, according to Ayala, is comparative anatomy. He describes and provides images of various skeletons to show the striking similarities between different creatures. Ayala argues that such similarities insinuate and are consistent with the idea that each fossil shares a common ancestor. Of course, a common response to this idea is that morphological similarities indicate a common designer rather than a common ancestor. Dembski and Wells elaborate on this type of counterargument:

In a 1990 book intended to refute critics of Darwinian evolution, biologist Tim Berra used pictures of various models of Corvette automobiles to illustrate how the fossil record provides evidence for descent with modification. “If you compare a 1953 and a 1954 Corvette, side by side,” he wrote, “then a 1954 and a 1955 model, and so on, the descent with modification is overwhelmingly obvious.” But automobiles are designed, not descended from other automobiles. Berra actually proved the opposite of what he intended, namely, that a series of similarities could be a product of intelligent design rather than Darwinian evolution.<sup>49</sup>

Ayala argues that this common-designer counterargument is misguided. From a purely practical point of view, he explains, “it seems incomprehensible that a turtle and a whale should swim, a horse run, a person write, and a bird or bat fly with forelimb structures built of the same bones.”<sup>50</sup> Engineers do not simply re-tweak parts from one system and

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<sup>48</sup>Dembski and Wells further explain that there are four ways to understand abrupt emergence, namely, “(1) Nonbiogenic formation. Organisms form without the direct causal agency of other organisms. In place of life begetting life, here we have nonlife begetting life; (2) symbiogenic reorganization. Organisms emerge when different organisms from different species come together and reorganize themselves into new organisms; (3) biogenic reinvention—organisms reinvent themselves in midstream. At one moment they have certain morphological and genetic features, at the next they have vastly different set of such features. (4) Generative transmutation. Organisms, in reproducing, produce offspring that are vastly different from themselves.” Dembski and Wells, *The Design of Life*, 78.

<sup>49</sup>Ibid., 88.

<sup>50</sup>Ayala, *Darwin and Intelligent Design*, 34. Ayala also writes, “Why are our arms and our legs, which are used for such different functions, made of the same materials, the same bones, muscles, and nerves, all arranged in the same overall pattern? Evolution makes sense of the anomaly. Our remote ancestors’ forelimbs were legs. After our ancestors became bipedal and started using their forelimbs for functions other than walking, these became gradually modified but retained their original composition and

retool them for another system. An engineer would develop totally new parts that were designed specifically for the needed functions. If we accept the idea that every organism had a common ancestor, then similarities of structures make sense.<sup>51</sup> If we accept the idea of design, however, it becomes more challenging to understand why similar parts are retooled for different functions.

To provide additional support to the common ancestry interpretation of morphological similarities, Ayala explicates the evidence from embryonic development and vestiges. He explains,

The embryos of humans and other non-aquatic vertebrates exhibit gill slits even though they never breathe through gills. These slits are found in the embryos of all vertebrates because they share as common ancestors the fish in which these structures first evolved. Human embryos also exhibit, by the fourth week of development, a well-defined tail, which reaches its maximum length at six weeks. Similar embryonic tails are found in other mammals, such as dogs, horses, and monkeys; in humans, however, the tail eventually shortens, persisting only as a rudiment in the adult coccyx. Embryonic rudiments are inconsistent with claims of intelligent design: why would a structure be designed to form during early development if it will disappear before birth?<sup>52</sup>

In this paragraph, Ayala continues to develop the idea that evidence for common ancestry provides evidence against ID. His assumption is that a designer would not create (or allow) situations where early stages of embryonic development form structures that seem

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arrangement. Engineers start with raw materials and a design suited for a particular purpose; evolution can only modify what is already there. An engineer who would design both cars and airplanes, or both wings and wheels, using the same materials arranged in a similar pattern, would surely be fired.” Ayala, “From Paley to Darwin,” 65. ID advocates recognize this phenomenon as well. Dembski and Wells acknowledge, “Similarity of structure and divergence of function is common. For instance, the pattern of bones in a bat’s wing is similar to that in a porpoise’s flipper, though the wing is used for flying and the flipper is used for swimming.” Dembski and Wells, *The Design of Life*, 117.

<sup>51</sup>Ayala, *The Big Questions*, 19.

<sup>52</sup>Ibid., 22.

superfluous during later stages.<sup>53</sup> Vestiges illustrate this point for Ayala, because he considers them instances of imperfections that negate the idea of design.<sup>54</sup>

While the evidence mentioned above is enough to convince Ayala of the *fact of evolution*, he argues that the most conclusive evidence comes from molecular biology.<sup>55</sup>

He contends,

The virtually unlimited evolutionary information encoded in the DNA sequence of living organisms allows evolutionists to reconstruct any evolutionary relationships that have led to present-day organisms, or among them, with as much detail as wanted. Invest the necessary resources (time and laboratory expenses), and you can have the answer to any query with as much precision as you want.<sup>56</sup>

Molecular biology, for Ayala, makes it possible to reconstruct the entire tree of life.<sup>57</sup>

This makes any alleged gap in the fossil record irrelevant, and it confirms various predictions made by the common ancestry thesis. Ayala explains the molecular evidence in great detail, and he is worth quoting at length:

The molecular components of organisms are remarkably uniform in the nature of the components, as well as in the ways in which they are assembled and used. In all bacteria, archaea, plants, animals, and humans, the DNA consists of a different

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<sup>53</sup>He also seems to assume that ID necessarily rejects all forms of evolutionary development. I demonstrate in chap. 4 that this assumption is incorrect.

<sup>54</sup>Ayala, *Darwin and Intelligent Design*, 36. Contra Ayala, Dembski and Wells argue, “Vestigial structures are entirely consistent with intelligent design, suggesting structures that were initially designed but then lost their function through accident to disuse.” Dembski and Wells, *The Design of Life*, 133. Later they argue, “[Vestiges] are entirely consistent with evolution as a process directed by a designing intelligence. Bottom line: vestigiality does not make the design problem go away” (ibid., 136).

<sup>55</sup>Ayala, *Darwin and Intelligent Design*, 37.

<sup>56</sup>Francisco J. Ayala, “Molecular Evolution,” in *Evolution: The First Four Billion Years*, ed. Michael Ruse and Joseph Travis (Cambridge, MA: Harvard University Press, 2009), 132.

<sup>57</sup>Dembski and Wells disagree on this point. They write, “Molecular phylogeny has failed, utterly and completely, to establish that universal common ancestry is true. It has failed to provide reliable dating for, much less chronicle, the history of life. It has failed to specify what evolutionary relationships, if any, exist among living forms. And it has failed, spectacularly, to give an unambiguous indication of what the universal common ancestor—if there even was one—might have looked like. Was it an organism, a group of organisms, or a batch of chemicals? The molecular evidence for common ancestry, like the fossil and embryo evidence is plagued with inconsistencies and unanswered questions. In fact, Darwinism must be *assumed* in order to explain the evidence (or, as is increasingly the case, to explain it *away*).” Dembski and Wells, *The Design of Life*, 131.

sequence of the same four component nucleotides (represented as A, C, G, and T). The genetic code, by which the information contained in the DNA of the cell nucleus is passed on to proteins, is virtually the same in all organisms. . . . This unity reveals the genetic continuity and common ancestry of all organisms. There is no other rational way to account for their molecular uniformity when numerous alternative structures are in principle equally likely. The genetic code serves as an example. Each particular sequence of three nucleotides in the nuclear DNA acts as a pattern for the production of exactly the same amino acid in all organisms. This is no more necessary than it is for a language to use a particular combination of letters to represent a particular object.<sup>58</sup>

Ayala illustrates the persuasiveness of this evidence by considering what it would be like to compare two similar books to one another. He explains,

Both books are 200 pages long and contain the same number of chapters. Closer examination reveals that the two books are identical page for page and word for word, except that an occasional word – say, 1 in 100 – is different. The two books cannot have been written independently; either one has been copied from the other, or both have been copied, directly or indirectly, from the same original book. In living beings, if each component nucleotide of DNA is represented by one letter, the complete sequence of nucleotides in the DNA of a higher organism would require several hundred books, each with hundreds of pages, with several thousand letters on each page. When the “pages” (or sequences of nucleotides) in these “books” (genomes) are examined one by one, the correspondence in the “letters” (nucleotides) gives unmistakable evidence of common origin.<sup>59</sup>

This book analogy provides two arguments for common ancestry according to Ayala.

The first argument focuses on the fact that both books are written in the same language.

This suggests that both books, at a basic level, have a common language origin. The

second argument focuses on each individual character. If each character is virtually

identical (with just a few random mistakes), then one would reasonably discern that each

book has a specific common origin. When it comes to the evidence from DNA, Ayala’s

book analogy is appropriate. If two organisms have virtually identical DNA (character-

by-character), then one can reasonably assume that they originated from a common

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<sup>58</sup>Ayala, “Molecular Evolution,” 133.

<sup>59</sup>Ibid., 135-36.

source. While ID advocates contend that the common source originates from a common designer, Ayala contends that the evidence supports the notion of common ancestry.<sup>60</sup>

Ayala's case for common ancestry is compelling, although it seems there is a missing link in his argument. That is, he does not draw a clear connection between how evidence for common ancestry negates the scientific project of ID. Even though Dembski and Wells argue against common ancestry, they still grant that there is no scientific conflict between affirming both common ancestry and ID.<sup>61</sup> The major conflict between evolution and ID is actually a conflict regarding the *mechanism of evolution*. Ayala ironically admits that there are legitimate debates surrounding the *mechanism of evolution*, and yet still finds it unsuitable to propose any teleological explanation in such debates. As I will argue later, this represents the fundamental difference between Dembski and Ayala.

### **Evidence for Human Evolution**

The third step in Ayala's case against ID includes a general argument for human evolution. This is perhaps a strategic step for Ayala, since arguably the main religious complaint with evolution is the notion that humans share a lineage with lower

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<sup>60</sup>Ayala, "Molecular Evolution," 136. These two ideas are not necessarily mutually exclusive, as will be demonstrated when examining Dembski's scientific project.

<sup>61</sup>One could argue that there is a theological critique between common ancestry and the biblical doctrine of creation, but this is an entirely different argument. Strictly speaking, ID (as a scientific position) does not take a stance on common ancestry. Dembski and Wells write, "It's important here not to get caught in a false dilemma. A false dilemma presents a choice between two options, neither of which is entirely acceptable, but which together purport to be mutually exclusive and exhaustive. The false dilemma here is common design versus common ancestry. It's logically possible to have common design without common ancestry and common ancestry without common design. But common design and common ancestry are not mutually exclusive. The two can work together. We can think of life consisting of hierarchically arranged design modules that over the course of natural history have sustained substantial evolutionary change through the activity of natural forces as well as through the guidance of a supervising intelligence. Just how much evolutionary change has occurred in each way remains an open question." Dembski and Wells, *The Design of Life*, 142. Behe also affirms common ancestry. He writes, "I find the idea of common descent (that all organisms share a common ancestor) fairly convincing, and have no particular reason to doubt it." Michael Behe, *Darwin's Black Box: The Biochemical Challenge to Evolution* (New York: Free Press, 1996), 5.

animals. From a Christian perspective, particularly, there is a conceivable conflict between human evolution and the doctrine of the *imago Dei*.<sup>62</sup> Because of this conflict, Ayala apparently needs to provide additional scientific arguments for human evolution to convince religious believers. If he succeeds in this task, then perhaps other ideas related to evolutionary biology will become easier to accept.<sup>63</sup>

Throughout Ayala's work, he provides a detailed exposition of the evidence for human evolution.<sup>64</sup> He explains that humans, from a scientific perspective, can be

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<sup>62</sup>I mention that there is a *conceivable conflict* (rather than a necessary conflict) between human evolution and the doctrine of the *imago Dei*, but this issue is certainly debated among Christian theologians. My purpose is not to argue for a particular position, but only to highlight a potential reason why Ayala thinks the evidence for human evolution provides a counter to ID. At certain points, he seems to conflate ID with a *special creationist perspective* (Adam created from the dust 6,000-10,000 years ago) on the *imago Dei*. If he is not conflating the two, then I am not sure why he considers evidence for human evolution an additional critique of ID. Dembski and Wells agree when they write, "Regardless of whether one is a biblical creationist or an atheistic Darwinist or anything in between, all are agreed that humans did not magically materialize out of nothing. Humans arose from preexisting material stuff. Indeed, the very word 'human' refers to the earth (humus) that lies beneath our feet. In this respect, monkeys and humans are both modified dirt, and that is true regardless of whether humans are, in addition, modified monkeys. ID is compatible with each of these possibilities, and there are ID proponents who hold to each." Dembski, and Wells, *The Design of Life*, 21-22. Behe, for example, agrees that humans are descendants of apes-like ancestors. He writes, "Evolution from a common ancestor, via changes in DNA, is *very* well supported. It may or may not be random. Thanks to evolution, scientists who sequence human DNA and find mutations that are helpful – against, say, our natural enemies – are not just studying the DNA of one person. They are actually observing the results of a struggle that's gone on for millennia and involved millions and millions of people. An ancestor of the modern human first sustained the helpful mutation, and her descendants outcompeted the descendants of many other humans. So the modern situation reflects an evolutionary history involving many people." Michael Behe, *The Edge of Evolution: The Search for the Limits of Darwinism* (New York: Free Press, 2007), 12.

<sup>63</sup>Note that this paragraph is mostly speculation on my part. I debated whether to include a section on human evolution in this chapter, since it did not seem entirely relevant to Ayala's case. In the end, however, I decided to include it since Ayala devotes a chapter to human evolution in *Darwin and Intelligent Design*. As mentioned in the footnote above, I think he does this because he conflates ID with a *special creationist perspective* on human origins. Elsewhere, he challenges this understanding of the *imago Dei* on scientific and theological grounds. He writes, "The Book of Genesis dramatically sets forth humans' lofty uniqueness within the natural world: 'So God created humankind in his image, in the image of God he created them; man and female he create them' (Gen. 1:27). It does not take a great deal of biological expertise to realize that humans have organs and limbs similar to those of other animals; that we bear our young like other mammals; that, bone by bone, there is a precise correspondence between the skeletons of a chimpanzee and a human. But it does not take much reflection to notice the unique distinctiveness of our species." Francisco J. Ayala, "Human Nature: One Evolutionist's View," in *Whatever Happened to the Soul?*, ed. Warren S. Brown, Nancy Murphy, and H. Newton Malony (Minneapolis: Fortress, 1998), 31.

<sup>64</sup>Cela-Conde and Ayala, *Human Evolution*.

distinguished from other hominids by their ability to develop language and make complex tools. This distinction can be detected in the fossil record once one examines the size of the cranium (called cranial capacity, or cc). Ayala notes, “The average cranial capacity of modern humans is 1,350 cc., while that of chimpanzees, with a comparable body size to ours, is 450 cc.”<sup>65</sup> When investigating the fossil record, therefore, it is critical to measure the size of the cranium.

Ayala begins his survey of the fossil record with the oldest known fossil hominids, *Sahelanthropus* and *Orrorin*. These hominids are dated between six million to seven million years old. The next oldest is *Ardipithecus*, and is over four million years old. From there, paleontologists have discovered numerous *Australopithecus* fossils, dating from three million to four million years old. *Australopithecus* is noteworthy because it had an upright human stance, but also smaller cranial capacity (500 cc, one-third the size of modern humans). The most famous *Australopithecus* discovery is Lucy (*Australopithecus afarensis*), which included forty percent of her skeleton at a single site.

A contemporary of *Australopithecus* was *Kenyanthropus* and *Paranthropus*, and *Homo habilis* appears in Africa just under two million years ago (600 cc). Shortly after *Homo habilis* comes *Homo erectus* (800-1,100 cc). *Homo erectus* migrated out of Africa into Europe, Asia, the Middle East, Indonesia, and northern China. Between 500,000 years and 1.8 million years, *Homo ergaster*, *Homo antecessor*, and *Homo heidelbergensis* also appear in the fossil record. These three species all have cranial capacities similar to *Homo erectus*.

The transition to *Homo sapiens*, according to the fossil record, occurred around 400,000 years ago. The evidence suggests that *Homo sapiens* and *Homo erectus* lived together, since there are fossil remains of *Homo erectus* dating to 100,000 years ago in Java (Indonesia). *Homo neanderthalensis* is another species that is contemporary with

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<sup>65</sup>Cela-Conde and Ayala, *Human Evolution*, 84.

*Homo sapiens*, and it appeared in Europe around 200,000 to 30,000 years ago. Many anthropologists argue that modern humans arose in Africa around 100,000 years ago.

As mentioned in the previous section, Ayala argues that the best evidence for evolution is the molecular evidence. He claims this is also true for human evolution.<sup>66</sup> After molecular biologists and geneticists completed the human genome project, Ayala explains that the evidence showed that in the genome regions shared by humans and chimpanzees, the two species are 99 percent identical. This means that there is a difference of about 30 million DNA letters out of the 3 billion letters in each genome.<sup>67</sup> Perhaps the most noteworthy genetic difference between humans and all other primates, however, is that humans have 23 pairs of chromosomes, whereas others have 24 pairs of chromosomes. From the perspective on common ancestry, Ayala suggests that this difference allows geneticists to make a prediction. He explains that somewhere in the human lineage, there must have been a mutation that caused two chromosomes to fuse in the human genome. If one could demonstrate that such a mutation did not occur, then it would provide a powerful counterargument to the claim that humans and other primates share a common ancestor. When geneticists successfully mapped the human genome, however, they discovered a fusion on human chromosome 2.<sup>68</sup> This provides further confirmation, for Ayala, of common ancestry.

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<sup>66</sup>When it comes to demonstrating that humans share a common ancestry with other primates, he explains that there are three ways to argue this: “by comparing living primates, including humans, with each other; by discovery and investigation of fossil remains of primates that lived in the past; and by comparing their DNA, proteins, and other molecules.” Ayala, *Am I a Monkey?*, 3.

<sup>67</sup>Ibid., 8. Of course, he also draws attention to the fact that this 1% is a significant difference. In his textbook, he expounds on the differences, “If one takes into account DNA stretches found in one species but not the other, the two genomes are about 96% identical, rather than nearly 99% identical as in the case of DNA sequences shared by both species. That is, a large amount of genetic material, about 3% or some 90 million DNA nucleotides, have been inserted or deleted since humans and chimps initiated their separate evolutionary ways, about 8-6 Ma.” Conde and Ayala, *Human Evolution*, 49.

<sup>68</sup>Ayala, *Am I a Monkey*, 11.

## Natural Selection and Teleology

Ayala's case for the *fact of evolution* is strong and cogent, but his argument concerning how the *fact of evolution* undermines ID is underdeveloped. He does offer two additional critiques of ID, however, which are worthy of careful evaluation. The first is an indirect critique that includes his defense of natural selection as the driving force of the evolutionary process. Ayala believes, as mentioned earlier, that this was Darwin's greatest discovery. He contends that the fundamental problem with design arguments in biology is that they do not appreciate the creative force of natural selection working on random mutations.<sup>69</sup> As mutations occur within an organism, Ayala explains that selection has the power to increase survivability in those organisms. If this simple process of mutation and natural selection is extended over vast periods of time, then the selection process is capable of incrementally producing large-scale changes.<sup>70</sup> Such changes will give the appearance of design, even though the Darwinian mechanism is a non-teleological process.

Of course, Ayala notes that many critics of evolution argue that natural selection is a negative process, and therefore does not have the power to create.<sup>71</sup>

Dembski expresses this very critique in his recent work *Being as Communion*:

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<sup>69</sup>Ayala explains, "The conundrum faced by Darwin can hardly be overestimated. The strength of the argument from design to demonstrate the role of the Creator had been forcefully set forth by Paley. Wherever there is function or design, we look for its author. It was Darwin's greatest accomplishment to show that the complex organization and functionality of living beings can be explained as the result of a natural process, natural selection, without any need to resort to a Creator or other external agent. . . . Darwin went on to provide a natural explanation of design. The seemingly purposeful aspects of living beings could now be explained, like the phenomena of the inanimate world, by the methods of science, as the result of natural laws manifested in natural processes." Ayala, *Darwin and Intelligent Design*, 19.

<sup>70</sup>Conde and Ayala describe the selection process as follows: "The differential reproduction of alternative hereditary variants, determined by the fact that some variants increase the likelihood that the organisms having them will survive and reproduce more successfully than will organisms carrying alternative variants. Selection may occur as a result of differences in survival, in fertility, in rate of development, in mating success, or in any other aspect of the life cycle." Conde and Ayala, *Human Evolution*, 9.

<sup>71</sup>Ayala, *Darwin and Intelligent Design*, 61-62.

Natural selection does not so much select for adaptive advantages as rule out maladaptive disadvantages, excluding the latter from survival and reproduction and thus eliminating them from the evolutionary tree. Natural selection is in the business of ruling out possibilities, thereby producing information in the structures and organisms it has retained. An ongoing point of controversy in biology is the extent to which natural selection can generate increases in novel information needed to drive the evolution of life. Some see it as biology's primary source of information. Others see its creative potential in producing information quite limited.<sup>72</sup>

Contra Dembski, Ayala maintains that natural selection is much more than an eliminative process. Instead, natural selection generates real novelty because it “increases the probability of otherwise extremely improbable genetic combinations.”<sup>73</sup> *Chance* by itself does not produce improbable genetic combinations, but the combination of *chance* and *necessity* (mutations and natural selection) increases the creative power of unguided evolution.<sup>74</sup> Elsewhere Ayala explains that “although [natural selection] does not ‘create’ the component entities upon which it operates (genes and genetic mutations), it does yield ‘design’, combinations that could not have existed otherwise and that are beneficial to the organisms.”<sup>75</sup> Darwinian evolution, therefore, is not a random process.<sup>76</sup> It is a selective process that has the ability to produce *functional* design within organisms.<sup>77</sup>

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<sup>72</sup>William A. Dembski, *Being as Communion: A Metaphysics of Information* (Burlington, VT: Ashgate, 2014), 20.

<sup>73</sup>Ayala, *Darwin and Intelligent Design*, 61-62.

<sup>74</sup>Ayala writes, “The theory of evolution conveys chance and necessity intricately conjoined in the stuff of life. Contingency and determinism interlocked in a natural process that has produced the most complex, diverse, and beautiful entities in the universe: the organisms that populate the earth, including humans, who think and love, are endowed with free will and creative powers, and are able to analyze the process of evolution itself that brought them into existence. This was Darwin’s fundamental discovery, that there is a process that is creative though not conscious.” Ayala, “From Paley to Darwin,” 75.

<sup>75</sup>Ayala, *The Big Questions*, 33.

<sup>76</sup>Ayala notes that mutations are random, but when mutations are selected for a particular advantage, the process of evolution ceases to be random. He writes, “Mutations are said to be accidental, undirected, random, or chance events. These terms are often used as synonyms, but there are at least three different senses in which they are predicated of the mutation process. First, mutations are accidental or chance events, in the sense that they are rare exceptions to the regularity of the process of DNA replication, which normally involves precise copying of the hereditary information, encoded in the nucleotide sequences. Second, mutations are accidental, random, or chance events also because there is no way of knowing whether a given gene or genome will mutate in a particular cell or in a particular generation. We

So what makes a Darwinian explanation better than a teleological explanation when it comes to functional design within organisms? Ayala contends that natural selection, while giving the *appearance* of design, does not look like a premeditated process. He explains,

An engineer has a preconception of what he wants to design and will select suitable materials and modify the design so that it fulfills the intended function. On the contrary, natural selection has no foresight, nor does it operate according to some preconceived plan. Rather, it is purely natural process resulting from the interacting properties of physicochemical and biological entities. Natural selection is simply a consequence of the differential survival and reproduction of living beings, as pointed out. It has some appearance of purposefulness because it is conditioned by the environment: which organisms survive and reproduce more effectively depends on which variations they happen to possess that are useful or beneficial to them in the place and at the time where they live.<sup>78</sup>

Since natural design is conditioned by the environment, Ayala reasons that the term *adaptation* is more apt than *design* when they speak about organisms and their features.

Gills, for example, were not designed for breathing in water; they were adapted to live in water. Legs, similarly, were adapted for walking and wings were adapted for flying.<sup>79</sup>

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cannot predict which individuals will have a new mutation and which ones will not, nor can we predict which gene will mutate in a given individual. This does not imply that no regularities exist in the mutation process; the regularities are those associated with stochastic processes, to which probabilities can be assigned. There is a definite probability (although it may not have been ascertained) that a given gene will mutate in any given individual. Moreover, it is not true that any mutation is just as likely to occur as any other mutation. Third, mutations are accidental, undirected, random, or chance events in a sense that is very important for evolution: they are unoriented with respect to adaptation. Mutations occur independently of whether or not they are adaptive in the environments where the organisms live. In fact, newly arisen mutations are much more likely to be deleterious than beneficial. It is easy to see why this should be so." Ayala, "From Paley to Darwin," 73-74. Ayala further explains, "The combination of genetic units that carries the hereditary information responsible for the formation of the vertebrate eye could have never been produced purely by a random process - not even if we allow for the three and a half billion years during which life has existed on earth. This is the argument advanced by proponents of intelligent design. But evolution is not a process governed by random events." Ayala, *Darwin and Intelligent Design*, 62.

<sup>77</sup>Ayala writes, "As a consequence of natural selection, organisms exhibit design, that is, adaptive organs and functions, but it is not 'intelligent' design, imposed by God as a Supreme Engineer. Rather it is the result of a natural process of selection, promoting the adaptation of organisms to their environments." Ayala, *Darwin and Intelligent Design*, 13.

<sup>78</sup>Ayala, *Darwin's Gift*, 70.

<sup>79</sup>Ayala, *Darwin and Intelligent Design*, 54.

While scientists may refer to such features as *designed*, Ayala assures readers that scientists are not intending to communicate that such features were actually designed. Scientists use design language to express that organisms are adapted to particular environments for survival advantages.

### Scientific Problems with ID

Developing a proper understanding of natural selection, for Ayala, is the easiest way to recognize problems with the design argument. Once this understanding is established, he provides one last step in his scientific critique of ID by responding to specific arguments advanced by ID advocates. Most notable are his critiques of Behe's argument for IC and Dembski's case for SC. In addition to these specific critiques, Ayala also criticizes ID for doing nothing more than reviving Paley's outdated design argument,<sup>80</sup> for being an underhanded political ploy to get religion into the science classroom,<sup>81</sup> and for not recognizing MN as an appropriate restriction for scientific

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<sup>80</sup>Ayala writes, "In the 1990s, several authors, notably biochemist Michael Behe (1996), theorist William Dembski (1995), and law professor Phillip Johnson (2000), among others, revived the argument from design." Ayala, "Darwin and Intelligent Design," in *Science and Religion in Dialogue* (Malden, MA: Blackwell, 2010), 2:752. Ayala also frequently conflates Paley's argument with the modern ID movement. He further writes, "The argument from design is a two-tined argument. The first prong, as formulated for example by the English author William Paley (1743-1805), asserts that organisms, in their wholes, in their parts, and in their relations to one another and to the environment, appear to have been designed for serving certain functions and to fulfill certain ways of life. The second prong of the argument affirms that only God, an omnipotent and omniscient creator, could account for the diversity, perfection, and functionality of living organisms and their parts." Ayala, "There is No Place," 365.

<sup>81</sup>Ayala contends that authors like Dembski "sought to hide that their argument from design was an argument for the existence of God, so that intelligent design theory could be taught in the public schools, as an alternative to the theory of evolution, without incurring conflict with the United States Constitution, which forbids the endorsement of any religious beliefs in public institutions." Ayala, *Darwin and Intelligent Design*, 71. Even though ID advocates frequently deny this charge, many ID critics are persuaded that ID advocates are not being genuine. One particular incident that has convinced courts that ID advocates are being disingenuous is the various additions of the ID textbook, *Of Pandas and People: The Central Question of Biological Origins*, 2<sup>nd</sup> ed., ed. Percival Davis and Dean H. Kenyon (Dallas: Haughton, 1993). Early editions used the word "creation" as an alternative to evolution, whereas later editions used the phrase "intelligent design." This has caused many ID critics to suspect that the *real* motivation for ID is to sneak creationism (a religious doctrine) into the biology classroom. Ayala agrees with this critique. He writes, "Explicit reference to God is avoided, so that the 'theory' of ID can be taught in the public schools as an alternative to the theory of evolution without incurring conflict with the U.S. Constitution, which forbids the endorsement of any religious beliefs in public institutions." Ayala, "There

investigation.<sup>82</sup> While these additional critiques are worthy of examination, I skip them in this section simply because they are not pertinent to the overall purpose of this dissertation.<sup>83</sup> For my purposes, I will only assess his critiques of Behe and Dembski.

Ayala spends most of his time on Behe, since he considers Behe “the only proponent of ID who qualifies as a bona fide biologist.”<sup>84</sup> Behe’s IC is an attempt to demonstrate that certain features in biology are incapable of being explained by a Darwinian process. Darwin himself wrote, “If it could be demonstrated that any complex organ existed, which could not possibly have been formed by numerous, successive, slight modifications, my theory would absolutely break down. But I can find out no such case.”<sup>85</sup> Behe seeks to demonstrate that such organs do exist, and most frequently cites the bacterial flagellum as a powerful critique of Darwinism. Behe writes,

As biochemists have begun to examine apparently simple structures like cilia and flagella, they have discovered staggering complexity, with dozens or even hundreds of precisely tailored parts. . . . As the number of required parts increases, the difficulty of gradually putting the system together skyrockets, and the likelihood of indirect scenarios plummets. . . . Darwinian theory has given no explanation for the

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Is No Place,” 365. While there is some justified concern to Ayala’s (and other critics’) complaint on this issue, it seems altogether misguided. Dembski notes that Stoic philosophers from ancient Greece developed a theory of design, which provides an illustration of how one can affirm ID without a committing to a particular religious doctrine of creation. William A. Dembski, “What Intelligent Design is Not,” in *Signs of Intelligence: Understanding Intelligent Design*, ed. William Dembski and James Kushiner (Grand Rapids: Brazos, 2001), 19-20.

<sup>82</sup>Ayala explains that if science is the study of the natural world, then our methods of science should strictly involve naturalistic explanations. He writes, “Science has nothing decisive to say about values, whether economic, esthetic, or moral; about the meaning of life or its purpose; about religious beliefs as such.” Ayala, *Darwin and Intelligent Design*, 100. Ayala further emphasizes that he does not espouse metaphysical naturalism, only methodological naturalism when it comes to scientific investigation. He argues elsewhere, however, “nothing in the world of nature escapes the scientific mode of knowledge, and that we owe this universality to Darwin’s revolution.” Ayala, “From Paley to Darwin,” 57.

<sup>83</sup>For a good critique of Ayala’s additional arguments, see Jeffrey Koperski, “Two Bad Ways to Attack Intelligent Design and Two Good Ones,” *Zygon* 43, no. 2 (2008): 437.

<sup>84</sup>Ayala, “There is No Place,” 376.

<sup>85</sup>Darwin, *Origin of Species*, 142.

cilium of flagellum. The overwhelming complexity of the swimming systems push us to think it may never give an explanation.<sup>86</sup>

What Darwin could not have imagined, presumably, is the staggering complexity that exists within the most basic units of life. Structures like the bacterial flagellum, because the various interconnect parts, could not possibly have been formed by numerous, successive, slight modifications, according to Behe. Thus Darwin's theory is, at best, incomplete.

Ayala regards Behe's argument as nothing more than a restatement of Paley's idea that "several parts are framed and put together for a purpose."<sup>87</sup> His principled objection to this idea is summarized as follows:

In different species of bacteria, there are different kinds of flagella, some simpler than the one described by Behe, others just different, even very different, as in the archaea, a very large bacteria-like group of organisms. Moreover, motility in many bacteria is accomplished without flagella at all. Still more, biochemists have shown that some flagellum components may have evolved from secretory systems, which are very similar to the flagellum, but lack some of the flagellum's components (see, for example, Liu & Ochman, 2007; Pallen & Matzke, 2006). The argument for the irreducible complexity of the flagellum is formulated, like other ID arguments, as an *argument from ignorance*: because one author does not know how a complex organ may have come about, it must be the case that it is irreducibly complex. This argument from ignorance dissolves as scientific knowledge advances, or when pre-existing scientific knowledge is taken into account.<sup>88</sup>

IC, for Ayala, is simply an argument from ignorance that offers no positive scientific explanation.<sup>89</sup> He further maintains,

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<sup>86</sup>Behe, *Darwin's Black Box*, 73.

<sup>87</sup>Paley, *Natural Theology*, 7. While such an argument worked for Paley's contemporaries, Ayala chides ID advocates for not familiarizing themselves with scientific insights available since the Darwinian revolution. See Ayala, "Darwin and Intelligent Design," 754.

<sup>88</sup>Ayala, "There Is No Place," 374.

<sup>89</sup>Ayala further writes, "the ID 'explanation' is not a scientific hypothesis that can be tested by observation and experiment. Indeed, ID does not advance any explanation, but it amounts only to a negative claim: that the relevant evolutionary explanations are not satisfactory." *Ibid.*, 374. Ayala goes on further to describe Behe's shortcomings, not only in terms of methodology, but also in terms of his scientific ignorance. In reference to the mechanisms regarding blood clotting, Behe claimed in 1996 that "no one on earth has the vaguest idea how the coagulation cascade came to be." Behe, *Darwin's Black Box*, 97. Ayala is astonished by Behe's claim and responds, "[There are] numerous scientific papers about

The claim is that if evolution fails to explain some biological phenomenon, ID must be the correct explanation. This is a misunderstanding of the scientific process. If one explanation fails, it does not necessarily follow that some other proposed explanation is correct. Explanations must stand on their own evidence, not on the failure of their alternatives. Scientific explanations or hypotheses are creations of the mind, conjectures, imaginative exploits about the makeup and operation of the natural world. It is the imaginative preconception of what might be true in a particular case that guides observations and experiments designed to test whether a hypothesis is correct.<sup>90</sup>

These paragraphs reference two related but distinct complaints with ID. First, ID is structured as a negative argument against Darwinian mechanisms, rather than a positive argument for design. Ayala contends that ID does not offer a proposition to test, “but makes only the lame claim that the theory of evolution by natural selection cannot account for the complexity of organisms.”<sup>91</sup> As such, ID is ostensibly an argument based upon scientific ignorance. This relates to Ayala’s second complaint, namely, that scientific explanations ought to offer evidence, rather than merely critiquing already existing theories. Highlighting the shortcomings in evolutionary theory, according to Ayala, does nothing to establish a case for ID. ID is a separate idea, which needs positive evidence to gain respect within the scientific community.

In addition to these principled objections against IC, Ayala further contends that biochemists have already shown that the bacterial flagellum is not irreducibly complex. He maintains that there are plausible Darwinian accounts demonstrating how

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the evolution of the various components of the blood-clotting mechanisms in vertebrates, including ‘The Evolution of Vertebrate Blood Coagulation: A case of Yin and Yang’ by the eminent biochemist Russell F. Doolittle, published in 1993.” Ayala, “There Is No Place,” 377.

<sup>90</sup>Ayala, “There Is No Place,” 375.

<sup>91</sup>Ibid., 376.

complex systems like the bacterial flagellum can arise through gradual and cumulative evolutionary processes.<sup>92</sup> He explains,

The bacterial flagellum does not exist. In different species of bacteria there are different kinds of flagella, some simpler than the one described by Behe, others just different—even very different, as in the archaea, a very large group of bacteria-like organisms. Moreover, motility in many bacteria is accomplished without flagella at all. Biochemists have shown that some flagellum components may have evolved from secretory systems, which are very similar to the flagellum but lack some of the flagellum’s components. The flagellum described by Behe has essentially the same structure as type-III secretory systems, although these lack the motor protein.<sup>93</sup>

Ayala’s counterargument to Behe’s flagellum example is frequently cited by ID critics. Proponents of ID, however, maintain that the type-III secretory system (TTSS) is not an evolutionary precursor to the flagellum. Dembski and Wells, for example, reference an article in the *Journal of Molecular Microbiology and Biotechnology* (published in 2000) to argue that TTSS evolved from the bacterial flagellum, rather than the other way around.<sup>94</sup> They argue,

At best, the bacterial flagellum could explain the evolution of the TTSS. But even that isn’t quite right. The TTSS is, after all, much simpler than the flagellum. The flagellum requires an additional thirty or forty proteins, which in turn need to be accounted for. Evolution needs to explain the emergence of complexity from simplicity. But if the TTSS (de-)evolved from the flagellum, then we’ve done the exact opposite (i.e., we’ve explained the simpler in terms of the more complex).<sup>95</sup>

Dembski and Wells further conclude that the scientific literature shows “a complete absence of detailed, testable, step-by-step proposals for how coevolution and co-option could actually produce irreducibly complex biochemical systems.”<sup>96</sup> Whether Dembski

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<sup>92</sup>Ayala, *Darwin and Intelligent Design*, 14. Later Ayala explains that “evolutionists have pointed out, again and again, with supporting evidence, that organs and other components of living beings are not irreducibly complex—they do not come about suddenly, or in one fell swoop” (ibid., 78).

<sup>93</sup>Ayala, *Darwin and Intelligent Design*, 81.

<sup>94</sup>L. Nguyen et al, “Phylogenetic Analyses of the Constituents of Type III Protein Secretion Systems,” *Journal of Molecular Microbiology and Biotechnology* 2, no. 2 (April 2000): 125-44.

<sup>95</sup>Dembski and Wells, *The Design of Life*, 155.

<sup>96</sup>Ibid., 155.

and Wells are correct in their interpretation of the evidence is a question outside the scope of dissertation. The more relevant question is whether Ayala provides a persuasive objection to Dembski's method for detecting design.

Ayala's critique of Dembski is unfortunately brief, oversimplified, and comes awfully close to misrepresenting Dembski's overall argument.<sup>97</sup> He explains Dembski's contribution to ID as follows:

The mathematically trained William Dembski, (1995, 2002) is another ID proponent who has used supposedly scientific arguments to demonstrate the irreducible complexity of organisms. According to Dembski, organisms exhibit "complex specified information," which is information that has a very low prior probability and, therefore, high information content. Dembski argues that mutation and natural selection are incapable of generating such highly improbable states of affairs.<sup>98</sup>

Recognizing the mathematical contributions of Dembski, Ayala refers to an equation where Dembski calculates that chances of a flagellum coming into existence as  $10^{-1170}$ . While such a number undoubtedly seems staggering, Ayala asserts that it is actually irrelevant since "Dembski does not take into account the role of natural selection and makes a number of erroneous assumptions."<sup>99</sup> But Ayala's claim that Dembski does not account for natural selection is peculiar. In the paragraph mentioned just above, Ayala recognizes that Dembski states "mutation *and natural selection* are incapable of generating highly improbable states of affairs." Why then would Ayala assume that Dembski does not take into account the role of natural selection? Ayala seems to gloss over Dembski's actual words, but what is more troubling is that Dembski actually provides extensive arguments regarding the inadequacy of natural selection to generate

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<sup>97</sup>Since Ayala's argument is so brief, it is hard to tell whether he misrepresents Dembski.

<sup>98</sup>Ayala, "There Is No Place," 378.

<sup>99</sup>Ibid.

SC.<sup>100</sup> Ayala never mentions those arguments, and therefore at best he overstates his critique of Dembski, and at worst he is unaware of Dembski's work on natural selection.

Ayala continues his critique of Dembski by claiming that other authors have pointed out numerous erroneous assumptions within his equations.<sup>101</sup> After referencing a few articles that critique Dembski's argument, he maintains that Dembski's numerological exercises suffer from several fatal flaws. Regrettably, Ayala only mentions one presumed flaw.<sup>102</sup> He cites Scott F. Gilbert and the Swarthmore College Evolution and Developmental Seminar, who argue,

Some of the Intelligent Design's more powerful arguments depend on a simple fallacy: the assumption of an end point. . . . [ID proponents claims that] it is impossible to evolve a particular protein because it has 100 amino acids and the chance of this occurring randomly is 1 in  $20^{100}$ . . . . But such supporters of ID don't know a billionth of how impossible it is! Let's say that your mother ovulated 500 eggs during her life and that your father produced  $2 \times 10^{12}$  sperm. The chances of *you* being born, then, are 1 in  $10^{15}$ . . . [and] the chances of your grandparents giving rise to you is 1 in  $10^{45}$ . Another reason not to argument with the Intelligent Design people, then, is that, by their own logic, they cannot exist.<sup>103</sup>

The apparent flaw mentioned above is that Dembski mistakenly assumes a predetermined end into his equation. When one makes such an assumption, then everything seems improbable, including the chances of me being the offspring of my grandparents. Ayala

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<sup>100</sup>I examine those arguments in chap. 4.

<sup>101</sup>He refers readers to papers in the following work: William A. Dembski and Michael Ruse, ed., *Debating Design: From Darwin to DNA* (Cambridge: Cambridge University Press, 2004) and in Robert T. Pennock, ed., *Intelligent Design Creationism and Its Critics: Philosophical, Theological, and Scientific Perspectives* (Cambridge, MA: MIT Press, 2001). He also refers to the following sources: Mark Perakh, *Unintelligent Design* (New York: Prometheus Books, 2004); idem, "There Is a Free Lunch after All: Dembski's Wrong Answers to Irrelevant Questions," in Matt Young and Taner Edis, ed., *Why Intelligent Design Fails: A Scientific Critique of the New Creationism* (New Brunswick, NJ: Rutgers University Press, 2004), 153-71; D. H. Wolpert, "William Dembski's Treatment of No Free Lunch Theorems Is Written in Jell-O," *Mathematical Review* 12 (2003): 12; and Joe Felsenstein, "Has Natural Selection Been Refuted? The Arguments of William Dembski," *National Center for Science Education Reports* 27 (2007): 21-26.

<sup>102</sup>Ayala, "There Is no Place," 378.

<sup>103</sup>Scott F. Gilbert and the Swarthmore College of Evolution, "The Aerodynamics of Flying Carpets: Why Biologists Are Loath to 'Teach the Controversy,'" in *The Panda's Black Box*, ed. Nathaniel C. Comfort (Baltimore: The Johns Hopkins University Press, 2007), 44-45.

emphasizes that improbable events happen all the time, and that Dembski's main problem is that he reasons backwards.<sup>104</sup> Natural selection, however, does not begin with the end in mind. Thus Ayala concludes that the Darwinian process provides a perfectly reasonable explanation for seemingly improbable biological structures, given the fact that evolution has no forethought.

### **Conclusion**

After examining Ayala's scientific case against ID, I maintained that he provides two potentially relevant critiques of ID. Those critiques include his case that random mutations working on natural selection are the sole mechanisms driving evolutionary development, and his contention that Dembski's equations for SC begin with the end in mind. In chapter 4, I show that both of these critiques are wrongheaded. Before making that case, however, I will examine Ayala's theological critique of ID in the next chapter, which centers on the problem of dysteleology. While this critique does nothing to undermine the scientific project of ID, it does provide a challenge to theologians who embrace ID.<sup>105</sup>

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<sup>104</sup>Ayala, *Darwin and Intelligent Design*, 84. A close reading of Dembski's *The Design Inference*, however, shows that Dembski makes no such mistake. Dembski is a responsible mathematician, and he provides thorough details regarding his particular method for detecting design. See chap. 4 in this dissertation for more details.

<sup>105</sup>Ayala writes, "The theory of intelligent design is not good theology . . . because it leads to conclusions about the nature of the design quite different from those of omniscience, omnipotence, and benevolence that Christian theology predicates of God." Ayala, *Darwin and Intelligent Design*, 86.

## CHAPTER 3

### AYALA'S THEOLOGICAL CRITIQUE OF ID

#### Introduction

This chapter focuses on the central issue of my dissertation, namely, the claim that dysteleology undermines the ID project. Chapter 2 provided a brief look at Ayala's scientific critiques of ID, but his most interesting critique of ID is a theological one. He argues that divine design is inconsistent with divine goodness, given what is known about the imperfections of the natural world.<sup>1</sup> Ayala maintains that the central argument of ID is that functional design provides evidence for an intelligent designer.<sup>2</sup> He then critiques this argument, stating that if functional design provides evidence for an all-wise Creator, then one should equally argue that dysfunctional design provides evidence for an unintelligent Creator. The following response expresses the core idea in Ayala's theological critique of ID.<sup>3</sup>

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<sup>1</sup>Ayala writes, "The theory of intelligent design is not good theology either, because it leads to conclusion about the nature of the design quite different from those of omniscience, omnipotence, and benevolence that Christian theology predicates of God." Francisco J. Ayala, *Darwin and Intelligent Design* (Minneapolis: Fortress, 2006), 86. Elsewhere, Ayala writes, "This point depends on a particular view of God – shared by many people of faith – as omniscient, omnipotent, and benevolent. This point also depends on our knowledge of the natural world and, particularly, of the living world. The natural world abounds in catastrophes, disasters, imperfections, dysfunctions, suffering, and cruelty." Francisco J. Ayala, "Charles Darwin: Friend or Foe?," *Word & World* 29, no. 1 (2009): 21.

<sup>2</sup>In chap. 4, I will show that this definition of ID is simplistic and slightly misguided. To support his claim, he refers to Paley's argument stating that the human eye provides "conclusive evidence of an all-wise Creator." Francisco J. Ayala, "Chance and Necessity: Adaptation and Novelty in Evolution," in *Evolving Dialogue*, ed. J. B. Miller (Harrisburg, PA: Trinity, 2001), 233.

<sup>3</sup>Ayala writes, "I assert that scientific knowledge, the theory of evolution in particular, is consistent with religious belief in God, whereas creationism and intelligent design are not. This point depends on a particular view of God – shared by many people of faith – as omniscient, omnipotent, and benevolent. This point also depends on our knowledge of the natural world and, particularly, of the living world." Ayala, "Charles Darwin," 21.

Ayala's theological argument against ID should be classified as a subset of the classic problem of evil. He even refers to David Hume's famous articulation of this problem: "Is [God] willing to prevent evil, but not able? Then he is impotent. Is he able, but not willing? Then he is malevolent. Is he both able and willing? Whence then evil?"<sup>4</sup> Ayala applies Hume's argument to natural evil and, more specifically, to biological dysfunctions, cruelties, and oddities. He emphasizes that modern biology enhances the problem of natural evil because it reveals countless examples of imperfect design within living systems. If one claims that God is responsible for the intricate design of life, then, Ayala responds, such a claim leads logically to the notion that God is also responsible for the imperfections of life.<sup>5</sup>

Before Darwin, Ayala claims that traditional Christian theology did not have a good solution to the problem of natural evil.<sup>6</sup> It had solutions to the problem of moral evil, and, for Ayala, the best solution is the free-will defense. According to the free-will defense, God is not morally responsible for the free acts of human agents. Thus, when Mao Zedong developed severe political policies that resulted in the deaths of 70 million

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<sup>4</sup>Francisco J. Ayala, "Darwin and Intelligent Design," in vol. 2 of *Science and Religion in Dialogue*, ed. Melville Steward (Malden, MA: Blackwell, 2010), 763. This idea is not original to Hume, however. Epicurus asked the same question: "God either wants to eliminate bad things and cannot, or can but does not want to, or neither wishes to nor can, or both wants to and can. If he wants to and cannot, he is weak—and this does not apply to god. If he wants to and can, which is the only thing fitting for a god, where then to bad things come from? Or why does he not eliminate them?" Epicurus, *The Epicurus Reader*, trans. and ed. Brad Inwood and L. P. Gerson (Indianapolis: Hackett, 1994), 97.

<sup>5</sup>Francisco J. Ayala, *Am I a Monkey? Six Big Questions about Evolution* (Baltimore: The Johns Hopkins University Press, 2010), 77. Some might argue that examples of imperfections are rare. While Ayala disagrees with this claim, he concedes and responds, "Even if the dysfunctions, cruelties, and sadism of the living world were rare, which they are not, they would still need to be attributed to the Designer if the Designer had designed the living world." Ayala, *Darwin and Intelligent Design*, 9.

<sup>6</sup>Francisco J. Ayala, *Darwin's Gift to Science and Religion* (Washington, DC: Joseph Henry, 2007), 4. Of course, theologians were aware of natural evil before Darwin. Alvin Plantinga reminds us that "it didn't take Darwin to enable us to see that nature, in Tennyson's phrase (which antedates the publication of *the Origin of Species* by more than a decade), is 'red in tooth and claw'; nor does it take Darwin to enable us to see that the earth is old, and that during much of its history animals have suffered." Alvin Plantinga, *Where the Conflict Really Lies: Science, Religion, & Naturalism* (Oxford: Oxford University Press, 2011), 56-57.

people, God was not to blame. Mao was to blame. Ayala contends that Darwin's theory of evolution provides a similar justification for theologians hoping to solve the problem of natural evil. Darwin's innovative ideas introduce a *natural free-will defense* for the various imperfections within the world of biology because Darwinian evolution asserts that natural selection and random mutations are the sole driving forces of all biological development. Thus, when life displays examples of imperfection within biological systems, God is not to blame—the processes of natural selection and random mutation are to blame. For this reason, Ayala writes,

People of faith would do well to acknowledge Darwin's revolution and accept natural selection as the process that accounts for the design of organisms, as well as for the dysfunctions, oddities, and cruelties that pervade the world of life. Evolution makes it possible to attribute these mishaps to the natural processes (which have no moral implications) rather than to the direct creation of specific design of the Creator.<sup>7</sup>

While Darwin is often regarded as an enemy of religion, Ayala insists that he is actually a friend.<sup>8</sup> To further articulate and explicate Ayala's aforementioned argument, I offer the following formulation, which was introduced in chapter 1:<sup>9</sup>

1. A God who is omniscient, omnipotent, and benevolent would not create organisms with suboptimal design (assumption).
2. There are organisms that display features of suboptimal design in biology [as discovered by modern science].
3. ID states that functional organisms were created by God (Ayala's definition of ID).

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<sup>7</sup>Ayala, *Am I a Monkey?*, 78.

<sup>8</sup>Ayala writes, "As Aubrey Moore put it in 1891, 'Darwinism appeared, and, under the guise of a foe, did the work of a friend.' The theory of evolution, which at first had seemed to remove the need for God in the world, now has convincingly removed the need to explain the world's imperfections as failed outcomes of God's design." Ayala, "Darwin and Intelligent Design," 763.

<sup>9</sup>While I think this formulation accurately represents Ayala's theological case against ID, Ayala never formulates his argument. This is my best attempt to represent his theological case against ID.

4. If functional organisms were created by God, then one should also assume that organisms displaying features of suboptimal design were also created by God (Ayala's assumed implication of 3).
5. ID states that God created organisms that display features of suboptimal design (3 and 4).
6. ID is inconsistent with a God who is omniscient, omnipotent, and benevolent (1 and 5).
7. On the other hand, the theory of evolution states that *all organisms* originated through purely natural processes (Ayala's definition of evolution).
8. If all organisms originated through purely natural processes, then organisms that display features of suboptimal design also originated through purely natural processes (the logical implication of 7).
9. To state that organisms originated through purely natural processes implies that God did not create those organisms (clarification of 7 and 8).
10. The theory of evolution states that God did not create organisms that display features of suboptimal design (7, 8, and 9).
11. The theory of evolution is consistent with a God who is omniscient, omnipotent, and benevolent (1 and 10).
12. ∴ An omniscient, omnipotent, and omnibenevolent God is more consistent with evolution than with ID (6 and 11).

While I am not convinced that Ayala's argument is sound, it does provide important contributions for articulating a response to dysteleology from the perspective of ID.

### **God and Suboptimal Design**

The central assumption in Ayala's argument is that a God who is omniscient, omnipotent, and benevolent would not create organisms with suboptimal design (Premise 1). To deny this assumption, according to Ayala, should be considered blasphemy for contemporary religious believers.<sup>10</sup> He explains, "The defective design of organisms could be attributed to the gods of the ancient Greeks, Romans, and Egyptians, who fought with one another, made blunders, and were clumsy in their endeavors. But, in my view,

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<sup>10</sup>Ayala, *Darwin's Gift*, 160.

it is not compatible with special action by the omniscient and omnipotent God of Judaism, Christianity, and Islam.”<sup>11</sup> Ayala’s theological problem with ID is not that it provides evidence for actual design, but that it provides evidence for imperfect design, which is presumably not fitting for a creator with traditional omni-attributes.

Ayala’s problem is not new for Christian theologians, and there is a long tradition of Christian theologians attempting to reconcile the omni-attributes with the presence of suboptimal design. One should recognize, therefore, that Ayala’s theodicy is simply one attempt to solve this problem, and the heart of his attempt focuses on the notion that God was not *directly* responsible for suboptimal design.<sup>12</sup> In other words, he argues that God did not create vestigial organs *ex nihilo*; rather, he created the process of evolution, which in turn created vestigial organs. Of course this still implies that God created vestigial organs, but he did it *indirectly*. For Ayala’s first premise to carry weight, he needs to defend the notion that an *indirect* creation of suboptimal design makes God less responsible than a *direct* creation of suboptimal design. If Ayala cannot substantiate this claim, then the rest of his argument seems to rest on a faulty assumption, which will be explored more in the body of this chapter.

### **Suboptimal Design in Biology**

For the purposes of this dissertation, I consider Ayala’s second premise well established. He provides several examples and descriptions of suboptimal design, and, from my perspective, many of those examples and descriptions adequately support his

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<sup>11</sup>Francisco J. Ayala, “From Paley to Darwin: Design to Natural Selection,” in *Back to Darwin: A Richer Account of Evolution*, ed. John Cobb Jr. (Grand Rapids: Eerdmans, 2008), 66.

<sup>12</sup>Ayala writes, “[Think about] badly designed human jaws, parasites that kill millions of children, and poorly designed human reproductive system that accounts for millions of miscarriages every year in the world. If these dreadful happenings come about by *direct design* by God, God would seem responsible for the consequences. If engineers design cars that explode when you turn on the ignition key, they are accountable. But if the dreadful happenings come about by natural processes (evolution), there are no moral implications, because natural processes do not entail moral values.” Ayala, “Darwin and Intelligent Design,” 765, emphasis mine.

second premise.<sup>13</sup> He begins with the simple fact that 99 percent of all species that ever lived on the earth have become extinct. This fact, for Ayala, demonstrates that the evolutionary process for creating life has been a wasteful, rather than efficient, process. If evolution were a teleological process, however, one would presumably expect that far less than 1 billion species would have gone extinct.<sup>14</sup> Ayala's argument is that the God of Christianity would not intentionally plan mass extinctions, suffering in the animal kingdom, and a survival-of-the-fittest environment as the means of achieving his ultimate goals and purposes. Ayala's theological complaint lies not with the evolutionary process, but with the notion of inserting teleology into the evolutionary process. If evolution is undirected, however, then wasteful design is not a theological problem for Ayala.

In addition to the general wastefulness of the evolutionary process, Ayala also mentions current examples of imperfect design, such as the suboptimal design of the human eye. Those familiar with the history of teleological arguments will notice the rhetorical force of citing the human eye as an example of suboptimal design because design advocates have historically argued that the human eye is a powerful example of exquisite design. Ayala, however, focuses on the abnormal aspects of the human eye. For example, the path that light needs to travel to reach the cones and rods in the retina is less than optimal. To achieve vision, light must pass through the pupil, to the back of the eye, through the retina, and eventually to the photoreceptors, the cones and rods that convert light into electrical signals at the back of the retina. Once light hits the retina, it travels through a series of ganglion and bipolar cells before reaching the cones and rods.

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<sup>13</sup>Of course, one could argue that Ayala's examples are purely subjective. What makes the process of evolution a wasteful process? Why should one concede that the human eye contains an example of suboptimal design? I agree that there is an element of subjectivity in answering such questions, however, it is the same subjectivity allowed for ID advocates. If one accepts the principled arguments for ID, therefore, it seems that one should also accept the principled arguments for suboptimal design.

<sup>14</sup>Ayala, "From Paley to Darwin," 72. Elsewhere, he writes, "We know that more than 99 percent of all species that have ever lived on Earth have become extinct without issue. Thus, since the beginning of life on Earth 3.5 billion years ago, the number of different species that have lived on our planet is likely to be more than 1 billion." Ayala, *Darwin's Gift*, 71.

At this point, the light produces chemical changes within the cones and rods, and then sends electrical signals back through the bipolar and ganglion cells and eventually culminates in the optic nerve. This path is counterintuitive from an engineering perspective because an intelligent designer would make the retina more efficient by placing the photoreceptors in front of the bipolar and ganglion cells. If the human eye is designed, then, Ayala argues that the design is not intelligent.

In addition to the backwards wiring of the retina, there are no photoreceptors on the optic disk. This creates a situation where there is a blind spot within our visual field. When Ayala considers this fact, he notes that such a blind spot is not universal within the animal kingdom:

The most advanced mollusk eye is found in the octopus and the squid. It is just as complex and effective as the human eye and lacks the blind spot. The imperfection of the blind spot in the human eye is due to the fact that the nerve fibers of the human eye are collected inside the eye cavity, so that the optic nerve has to cross the retina on its way to the brain.<sup>15</sup>

After skillfully highlighting the shortcomings of the human eye compared to the most advanced mollusk eye, Ayala rhetorically asks, “Did the Creator have greater love for squids than for humans and thus exhibit greater care in designing their eyes than ours?”<sup>16</sup> This question underscores, for Ayala, the main theological reason for rejecting ID and embracing Darwin’s gift to theology.

Ayala further cites the small size of the human jaw, which makes it necessary to remove the wisdom teeth in adults. He argues that the human birth canal is too narrow, resulting in thousands upon thousands of babies and mothers dying during delivery.<sup>17</sup> He emphasizes the strange fact that human arms and legs have the same

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<sup>15</sup>Ayala, *Darwin and Intelligent Design*, 67.

<sup>16</sup>Ayala, *Am I a Monkey?* 77.

<sup>17</sup>Ayala writes that “20 percent of all recognized human pregnancies end in spontaneous miscarriage during the first two months of pregnancy.” Ayala, *Darwin’s Gift*, 157.

arrangement of bones, muscles, and nerves as many other mammals that use those arrangements for entirely different functions.<sup>18</sup> And given that such arrangements are used for different functions in different mammals, one could argue that those arrangements are not optimally designed for every function in every mammal. Ayala further considers various examples of cruelty in nature, including

the actions of predators (say, a chimpanzee) tearing apart their prey (say, a small monkey held alive and screaming by a chimpanzee biting large flesh morsels from it) or parasites destroying the functional organs of their hosts but also, and very abundantly, interactions between organisms of the same species, including between mates. A well-known example is the female praying mantis, which devours the male after coitus is completed. Less familiar is the fact that, if she gets the opportunity, the female will eat the head of the male *before* mating; thrashing the headless male mantis into spasms of “sexual frenzy” allows the female to connect his genitalia with hers.<sup>19</sup>

When taken together, Ayala’s various examples build a compelling case that dysfunctions, imperfections, and cruelties do exist in nature.<sup>20</sup> It seems, then, that Ayala’s second premise is correct.<sup>21</sup>

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<sup>18</sup>For example, bats use the arrangement of bones in their arms and hands for flying, rather than typing on a computer. Objects that are designed by engineers do not display such similarities. Ayala explains, “An engineer who would design cars and airplanes, or wings and wheels, using the same material arranged in a similar pattern, would surely be fired.” Ayala, *Darwin’s Gift*, 156.

<sup>19</sup>Ayala, *Darwin and Intelligent Design*, 88. Ayala further explains, “We know that some deficiencies are not just imperfections, but they are outright dysfunctional, jeopardizing the very function the organ or part is supposed to serve. Moreover, carnivorous predators behave in ways that by human standards would be judged cruel, and parasites seem designed with a sadistic purpose, since they exist by harming other organisms. The mating interactions between male and female in some insects, spiders, and other organisms would also be judged cruel and even sadistic by human standards.” *Ibid.*, 8.

<sup>20</sup>To consider a few more examples, Ayala mentions Tsunamis bringing destruction and death; the volcanic eruptions that erased Pompeii and Herculaneum, floods and droughts, lions that devour their prey, malaria, and parasites that kill millions of humans every year and make 500 million sick. See Ayala, “Charles Darwin,” 21. Similarly, Robert John Russell refers to natural evil as “disease, suffering, death of individual organisms and the extinction of species.” Robert John Russell, “Is Evil Evolving?,” *Dialog* 42, no. 3 (2003): 309.

<sup>21</sup>This should not surprise any Christian theologians, however. Even theologians who ascribe to a recent creation position (i.e., that earth is 6,000-10,000 years old) recognize that man lives in a fallen and broken world. Ayala’s examples of imperfections, therefore, are perfectly consistent with any of the traditional approaches to theodicy.

## **ID and Suboptimal Design**

The key claim in Ayala's argument is that Darwinian evolution somehow gets God off the hook for suboptimal design. If this claim is accepted, then it provides some warrant for the further claim that ID is inconsistent with suboptimal design. But what if an ID advocate claims that God designed the evolutionary process? Ayala argues that even this idea must be rejected, and he cites American philosopher David Hull to explain why:

What kind of God can one infer from the sort of phenomena epitomized by the species on Darwin's Galapagos Islands? The evolutionary process is rife with happenstance, contingency, incredible waste, death, pain and horror . . . . Whatever the God implied by evolutionary theory and the data of natural selection may be like, he is not the Protestant God of waste not, want not. He is also not the loving God who cares about his productions. He is not even the awful God pictured in the Book of Job. The God of the Galapagos is careless, wasteful, indifferent, almost diabolical. He is certainly not the sort of God whom anyone would be inclined to pray.<sup>22</sup>

Ironically, Ayala does not see Hull's criticism as a problem for theologians who embrace Darwinian evolution. He views this exclusively as an argument against ID. Why? Because, according to Ayala, ID argues that functional structures within organisms provide evidence that God created those structures (Premise 3). But if God intentionally designed such structures, then he also intentionally designed the evolutionary process that brought those structures into existence. And if functional design provides evidence for *intelligent* design, then the appearance of cruelty and dysfunction within the evolutionary process should provide evidence for *unintelligent* design (Premise 4). ID, then, implies that God's creation is suboptimally designed, which is inconsistent with a God who is omniscient, omnipotent, and benevolent (Premises 5 and 6). This is why Ayala writes that "ID is bad religion, bad theology, because it implies that the designer has undesirable attributes that we don't want to predicate about God."<sup>23</sup>

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<sup>22</sup>D. L. Hull, "God of the Galapagos," *Nature* 352 (1992): 485-86.

<sup>23</sup>Ayala, *Darwin's Gift*, 12.

Ayala then considers how ID advocates might respond to the problems he expresses above. Specifically, he considers Paley's and Behe's responses to the problem of suboptimal design. He cites Paley as arguing, "Irregularities and imperfections are of little or no weight, . . . but they are to be taken in conjunction with the unexceptionable evidences which we possess of skill, power, and benevolence displayed in other instances."<sup>24</sup> This response is not persuasive to Ayala, because, to restate his central argument, "If functional design manifests an intelligent designer, why should not deficiencies indicate that the designer is less than omniscient, or less than omnipotent, or less than omnificent?"<sup>25</sup> Paley is being inconsistent, according to Ayala, and, furthermore, Ayala stresses the point that Paley does not provide appropriate details regarding the nature of dysfunctions within the natural world.

Ayala leaves out an important passage that better explains Paley's position, however. Paley's counterargument does not depend upon specific details regarding cruelties that exist within the animal kingdom. He is making a principled argument that imperfections do not negate design. This is seen clearly when one looks at the difference between warts and eyes. Both are parts of the human body, but Paley does not argue that both are designed. Some features display design, and others do not. Paley explains this idea at length:

When we are enquiring simply after the *existence* of an intelligent Creator, imperfection, inaccuracy, liability to disorder, occasional irregularities, may subsist, in a considerable degree, without inducing any doubt into the question: just as a watch may frequently go wrong, seldom perhaps exactly right, may be faulty in some parts, defective in some, without the smallest ground of suspicion from thence arising, that it was not a watch; not made; or not made for the purpose ascribed to it. When faults are pointed out, and when a question is started concerning the skill of the artist, or the dexterity with which the work is executed, then indeed, in order to defend these qualities from accusation, we must be able, either to expose some

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<sup>24</sup>William Paley, *Natural Theology* (Oxford: Oxford University Press, 2006), 35-36, quoted in Ayala, *Darwin and Intelligent Design*, 8.

<sup>25</sup>Ayala, *Darwin and Intelligent Design*, 8.

intractableness and imperfection in the materials, or point out some invincible difficulty in the execution, into which imperfection and difficulty the matter of complaint may be resolved; or, if we cannot do this, we must adduce such specimens of consummate art and contrivance proceeding from the same hand, as may convince the enquirer, of the existence, in the case before him, of impediments like those which we have mentioned, although, what from the nature of the case is very likely to happen, they be unknown and unperceived by him. This we must do in order to vindicate the artist's skill, or, at least, the perfection of it; as we must also judge of his intention, and of the provisions employed in fulfilling that intention, not from an instance in which they fail, but from the great plurality of instances in which they succeed. But, after all, these are different questions from the question of the artist's existence; or, not: and the questions ought always to be kept separate in the mind.<sup>26</sup>

This paragraph seems to demonstrate that there is no inconsistency within Paley's argument. His foundational question is whether life provides evidence for an intelligent Creator.<sup>27</sup> When it comes to imperfect design, however, there is no reason to think this would undermine the evidence for design. Claiming that a particular object is designed does not entail that that object is optimally designed, nor does it entail that every object is designed. This means that a design advocate can consistently claim that some biological systems are designed, while others are not. Furthermore, a design advocate can claim that some biological systems are designed, even if those particular systems are not optimally designed. Ayala's analysis of Paley's argument, therefore, is misguided.

Ayala's appraisal of Behe's response to the problem of suboptimal design is equally problematic. He quotes Behe's response to imperfections as follows:

The argument from imperfection overlooks the possibility that the designer might have multiple motives, with engineering excellence oftentimes relegated to a secondary role . . . . The reasons that a designer would or would not do anything are vitally impossible to know unless the designer tells you specifically what those reasons are.<sup>28</sup>

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<sup>26</sup>Paley, *Natural Theology*, 35.

<sup>27</sup>The word "intelligent" refers generally to a conscious creator. Paley certainly believes that the God of the Bible is responsible for the design of life, but here he is not arguing for specific attributes within the creator such as being omnipresent, omnipotent, etc.

<sup>28</sup>Michael Behe, *Darwin's Black Box: The Biochemical Challenge to Evolution* (New York: Free, 2006), 223, cited in Ayala, *Darwin and Intelligent Design*, 85.

After providing this passage, Ayala argues that Behe’s statement “might have theological validity, but it destroys intelligent design as a scientific hypothesis, because it provides it with an empirically impenetrable shield against predictions of how ‘intelligent’ or ‘perfect’ a design will be.”<sup>29</sup> The problem with this response to Behe should be clear. Ayala claims that Behe is removing ID from science by making it impossible to predict how intelligent or perfect the design will be. For Ayala, such a move might be permissible theologically, but not scientifically. But Behe’s point is that questions regarding theodicy are not scientific questions, they are theological ones. Behe expounds on this point in *The Edge of Evolution*:

Whether on balance one thinks life was a worthwhile project or not—whether the designer of life was a dope, a demon, or a deity—that’s a topic on which opinions over the millennia have differed considerably. Each argument has some merit . . . . Maybe the designer *isn’t* all that beneficent or omnipotent. Science can’t answer questions like that.<sup>30</sup>

If Behe’s theological response to the theological problem of dysteleology makes ID unscientific, then what are the merits of Ayala’s theological critique of ID in the first place? Ayala seems to suggest that certain theological positions are deemed scientific—presumably positions where God does not act within creation—whereas others—particularly those offered by ID advocates—are unscientific. Behe, on the other hand, tries to keep science and theology separate. In so doing, he maintains that there are no scientific problems in asserting that the designer of life was a demon. The scientific question of design is not undermined by theological inquiries regarding the motives of the designer. If it were, then Ayala’s evolutionary theodicy should undermine the scientific theory of evolution.

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<sup>29</sup>Ayala, *Darwin and Intelligent Design*, 85-86.

<sup>30</sup>Michael Behe, *The Edge of Evolution: The Search for the Limits of Darwinism* (New York: Free, 2007), 238-39.

### Ayala's Evolutionary Theodicy

While Ayala's responses to Paley and Behe are unpersuasive, there remains an important question regarding the theological merits of his critique. Perhaps general design is consistent with the known imperfections in biology. This does not mean that the design of a God with omni-attributes is consistent with the known imperfections in biology. To understand the force of Ayala's theological critique against ID, one needs to understand his response to the problem of natural evil. For Ayala, the theory of evolution demonstrates that *all organisms* originated through a purely natural process, natural selection operating on random mutations (Premise 7).<sup>31</sup> This idea has implications for theodicy, because if all organisms originated through purely natural processes, then organisms that display features of suboptimal design also originated through purely natural processes (Premise 8). It follows, then, that suboptimal design is consistent with the character of God, since God is not the direct originator of suboptimal design. Suboptimal design is the result of natural processes that cannot be held to moral standards.<sup>32</sup> Darwin's discovery of natural selection was a gift to science and religion because it demonstrated that God is not responsible for suboptimal design (Premises 9 and 10). Thus, evolution is consistent with a God who is omniscient, omnipotent, and benevolent (Premise 11).

To expound on Ayala's theodicy, one can compare it to a traditional free will defense for moral evil. As mentioned above, Ayala maintains that theologians for centuries had a ready answer for moral evil, namely, human sin arising out of God's choice to give us free will.<sup>33</sup> He explains, "[Consider] human beings, who perpetrate all sorts of misdeeds and sins, even perjury, adultery, and murder. People of faith believe

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<sup>31</sup>In chap. 2, I clarified that Ayala calls this the *mechanism of evolution*.

<sup>32</sup>Ayala, *Am I a Monkey?* 80.

<sup>33</sup>Ayala, *Darwin's Gift*, 3.

that each human being is a creation of God, but this does not imply that God is responsible for human crimes and misdemeanors. Sin is a consequence of free will; the flip side of sin is virtue.<sup>34</sup>

Debates abound regarding whether a free will defense or theodicy actually solves the problem of moral evil, but I want to limit this discussion solely to the problem of natural evil. Ayala argues that before Darwin, theologians did not have a plausible solution to natural evil.<sup>35</sup> What Darwin did theologically, therefore, was to produce an unknown category for theologians working on the problem of theodicy. This unknown category was natural selection; a mechanism in biology that gave warrant to the proposal that all of life is the result of unguided processes rather than direct creation or specific design.<sup>36</sup> To use more theological language, natural selection provided a basis for saying that nature has a “free will” of its own. And if the free will defense works for moral evil, then one could argue that it works for natural evil as well.

Evolutionary theodicies might seem feasible on the surface, but there are deeper problems that should not be ignored by theologians. Robert John Russell, for example, highlights the most significant problem with evolutionary approaches to theodicy when he asks, “If, according to theistic evolution, God acts to create life through evolution, and since evolution necessarily includes disease, suffering, death and extinction, does this make God responsible for natural evil and, in turn render faith in

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<sup>34</sup>Ayala, *Am I a Monkey?* 79. A Calvinist might disagree with a free will defense, arguing, for example, that one can never get God off the hook for moral evil. In addition, they would argue that God is not directly responsible for moral evil, but one cannot deny that he is indirectly responsible.

<sup>35</sup>Ayala does not critique common theological responses such as natural evil being the consequence of moral evil or the fall of Satan before the creation of humanity.

<sup>36</sup>Francisco J. Ayala, “Evolution Beyond Biology: Comments and Responses,” *Theology and Science* 7, no. 4 (2009): 382.

God unintelligible?<sup>37</sup> This question highlights the biggest problem with Ayala's approach to theodicy, as explained by Chris Doran:

Ayala suggests that Christians are home free now that the "bad" design we see in the universe can be "blamed on/attributed to" evolutionary processes rather than God. It seems to me that the question that Ayala avoids is the question that still must be asked: Who created the laws that govern evolutionary processes? If we pursue this avenue of thought, then the issue is not whether the design of the universe or particular features in our universe are bad, imperfect, or cruel, but rather whether God imbuing the universe with the freedom to "create" itself through evolutionary processes is really worth it . . . . It's easy to take science seriously and say that God creates through evolutionary processes. It's quite another thing to swallow the fact that God then creates through pain, predation, and extinction.<sup>38</sup>

Doran's critique is significant, although he wrongly suggests that Ayala avoids this issue altogether. While Ayala certainly downplays the significance of critiques like Doran's, he does briefly address the problem. In so doing, he stresses the correlation between God giving humanity free will and God giving the natural world the capacity to create.<sup>39</sup> If God had not given humanity free will, then God could have ensured that the world would not contain moral evil. Of course, in such a situation, human beings would be entirely different creatures; perhaps not God's ideal creatures.<sup>40</sup> Similarly, God could have

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<sup>37</sup>Russell, "Is Evil Evolving?," 309.

<sup>38</sup>Chris Doran, "From Atheism to Theodicy to Intelligent Design: Responding to the Work of Francisco J. Ayala," *Theology and Science* 7, no. 4 (2009): 340.

<sup>39</sup>One could argue that the creation story in *Genesis* supports the idea that the natural world has the capacity to create. Ernan McMullin writes, "Theologians of the early Church were struck by the way in which the first verses of *Genesis* describe the origins of living things; God said: 'Let the earth bring forth nourishing crops . . . and fruit trees bearing fruit'; 'Let the waters bring forth living creatures and birds to fly above the earth'; 'Let the earth bring forth living creatures according to their kinds: cattle, creeping things, and beasts of the earth.' It seemed as though the Creator had, in the work of the Six Days, conferred successively upon waters and earth the power to bring forth all the living kinds." See Ernan McMullin, "Darwin and the Other Christian Tradition," *Zygon* 46, no. 2 (2011): 292.

<sup>40</sup>Ayala writes, "Critics might say that [free will] does not excuse God, because God could have created humans without free will (whatever these 'humans' may have been called and been like). But one could reasonably argue that 'humans' without free will would be a very different kind of creature, a being much less interesting and creative than humans are. Robots are not a good replacement for humans; robots do not perform virtuous deeds." Francisco J. Ayala, "Evolution Beyond Biology: Comments and Responses," *Theology and Science* 7, no. 4 (2009): 383.

created a meticulously controlled world, resulting in no natural suffering or defects, but that type of world, argues Ayala, would not be God's ideal world:

Before modern physical science came about, God (in some religious views) caused rain, drought, volcanic eruptions, and the like, to reward or punish people. This view entails that God would have caused the tsunami that killed 200,000 Indonesians a few years ago. That would seem incompatible with a benevolent God. However, we now know that tsunamis and other "natural" catastrophes come about by natural processes. Natural processes don't entail moral values. Some critics might say "that does not excuse God, because God created the world as it is. God could have created a different world, without catastrophes." Yes, according to some belief systems, God could have created a different world. But that would not be a creative universe, where galaxies form, stars and planetary systems come about, and continents drift causing earthquakes. The world that we have is creative and more exciting than a static world. This argument will not convince all, but is a valid argument for some as an account of physical evil, and many theologians use it, whether implicitly or explicitly.<sup>41</sup>

Concerning the evolution of life, Ayala argues that a world of life with evolution is much more exciting than a world without it.<sup>42</sup> Darwin's theory of evolution, furthermore, depicts a creative world "where new species arise, complex ecosystems come about, and humans have evolved."<sup>43</sup> In summary, if God got rid of this natural creativity, then the universe would be less interesting.

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<sup>41</sup>Ayala, "Darwin and Intelligent Design," 764-65. Of course, to embrace this argument, one must find the free will defense for moral evil plausible, which would presumably involve constructing a molinist, open theist, or panentheist theology. My best educated guess is that Ayala aligns most closely with panentheism. I say this because he quotes favorably Arthur Peacocke: "Any static conception of the way in which God sustains and holds the cosmos in being is therefore precluded, for new entities, structures, and processes appear in the course of time, so that God's action as Creator is both past and present: it is continuous . . . . The traditional notion of God *sustaining* the world in its general order and structure now has to be enriched by a dynamic and creative dimension." Ayala, "Charles Darwin," 20.

<sup>42</sup>For those who argue that God is still responsible for natural evil, Ayala responds, "Some would say . . . that because the world was created by God, God is ultimately responsible: God could have created a world without parasites or dysfunctionalities. Yes, others would answer, but a world of life with evolution is much more exciting; it is a creative world where new species arise, complex ecosystems come about, and humans have evolved. This account will not satisfy some people of faith and many unbelievers will surely find it less than cogent: a *Deus ex machina*. But I am suggesting that it may provide the beginning of an explanation for many people of faith, as well as for theologians." Ayala, "Darwin and Intelligent Design," 765.

<sup>43</sup>Ayala, *Am I a Monkey?*, 80. In addition to arguing that an evolving creation is more exciting than a static one, Ayala also contends that God could not have actualized a different world. Citing Keith

Ayala's *more exciting world* theodicy seems, according to theologians like Oliver Putz, incomplete and vague.<sup>44</sup> For whom is this creation exciting? Is it more exciting for the predator or for the prey? When pushed for clarity on such questions, Ayala responds, "I am writing as a scientist concerned about the theological implications of science. Thus, I have repeatedly asserted, using one or another form of expression, that the evolutionary account of biological 'evil' may provide a consideration for theologians to take into account."<sup>45</sup> Ayala's admission is honest and should perhaps cause theologians to regard his evolutionary theodicy as a basic proposal in need of further development. The problem with Ayala's admission, however, is that it puts his version of theistic evolution in the same boat as ID. Both agree that God is responsible for dysfunctions in creation; they just disagree with *how* God is responsible. On the one hand, Ayala wants to say that God is not responsible for biological dysfunctions because evolution did it. On the other, Ayala wants to claim that God is a good creator. But if God is truly the creator, then, at some point, God is the creator of the process of

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Ward, he writes, "Could [God] not actualize a world wherein suffering is not a possibility? He could not, if any world complex and diverse enough to include rational and moral agents must necessarily include the possibility of suffering . . . . A world with the sorts of success and happiness in it that we occasionally experience is a world that necessarily contains the possibility of failure and misery." Ayala, "Evolution Beyond Biology," 383. Contra Ayala, however, Russell argues, "The 'no choice' argument is based on a crucial underlying premise that is usually overlooked in discussion about evolution: it presupposes the laws of physics, or more generally the laws of nature, through which astrophysics, geology, chemistry, molecular and evolutionary biology, etc., work. Thus underlying the 'no choice' argument is the question of why our universe is characterized by these particular physical laws and not some other laws. Theologically this leads to the following point: Granted that if God were to create life by non-interventionist divine agency, God may have had 'no choice' other than to do so through neo-Darwinian evolution, assuming that the laws of nature are somehow 'given'. But the problem of 'God's choice' returns at a more fundamental level: since God created our universe *ex nihilo*, including its laws of nature, why did God choose to create *this* universe with *these* laws?" Russell, "Is Evil Evolving?," 311.

<sup>44</sup>Oliver Putz, "Love Actually: A Theodicy Response to Suffering in Nature. In Dialogue with Francisco Ayala," *Theology and Science* 7, no. 4 (2009): 349-50. Putz further writes, "The issue is exactly why God did not create a universe with different laws where death and suffering would have been impossible." *Ibid.*, 347.

<sup>45</sup>Ayala, "Evolution Beyond Biology," 383.

evolution. This means that one must admit that God is the ultimate creator of dysfunctions within biology, whether one ascribes to an evolutionary theodicy or not.

### **Conclusion**

Ayala's theological critique against ID is problematic for several reasons. First, there are no good reasons to assume that a God with omni-attributes would refrain from creating organisms with suboptimal design. In fact, the task of natural theodicy, which Ayala undertakes, is to come up with a plausible explanation for natural evil given the existence of God. Second, there are good reasons to think that examples of suboptimal design are not actually defeaters to the notion of design. One could claim, for instance, that suboptimal design is a defeater for a God with omni-attributes who designs, but Ayala does not successfully articulate or defend this claim. Third, it is not clear that Ayala's theodicy can avoid the theological challenges he poses as critiques against ID. Moreover, if Ayala's theodicy could avoid those critiques, then it is not clear that such a theodicy would be off limits for ID advocates as well. Behe, for example, explains that one of the main problems with ID critics is that they try to force advocates of ID to deny every aspect of evolution:

One difficulty of writing a book questioning the sufficiency of Darwin's theory is that some people mistakenly conclude you're rejecting it in toto. It is time to get beyond either/or thinking. Random mutation is a completely adequate explanation for some features of life, but not for others. This book looks for the line between the random and the nonrandom that defines the edge of evolution.<sup>46</sup>

This is a crucial insight in assessing the debate over ID. ID advocates do not claim that every aspect of biology is designed, nor do they deny every aspect of evolution. Given this fact, Ayala's conclusion that a God with omni-attributes is more consistent with evolution than ID is unfounded, because it relies upon a common misunderstanding of the

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<sup>46</sup>Behe, *The Edge of Evolution*, 14.

scientific project of ID. This misunderstanding will be more clearly seen after I examine and summarize Dembski's scientific work on ID in the next chapter.

## CHAPTER 4

### DEMBSKI'S METHOD VERSUS AYALA'S SCIENCE

While chapters 2 and 3 examined Ayala's scientific and theological arguments against ID, this chapter introduces Dembski's articulation of ID as a method for detecting design. This chapter is significant because it provides the background for understanding where Ayala's theological critique against ID goes astray. In chapter 1, I mentioned that Dembski's ID project could be separated into four related but distinct tasks:

1. ID produces an objective method (SC) that distinguishes *intelligent causation* from *chance* or *necessity*.
2. ID produces scientific and/or mathematical arguments that demonstrate the inadequacy of Darwinian mechanisms to produce SC.
3. ID produces evidence that supports the claim that there are certain features in the natural world that cannot be explained by undirected natural forces.
4. ID produces a way of understanding divine action.

The first three tasks are the focus of this chapter, whereas the fourth task will be covered in the next. Dembski's first task, then, is to produce an objective method for distinguishing *intelligent causation* from *chance* or *necessity*. If successful, then one must consider whether SC—Dembski's criteria for detecting design—offers an appropriate method for making such distinctions.

Dembski's second task advances the case that SC is relevant to the field of biology. One might concede that SC is scientific in principle, but that would not imply that SC applies to every scientific field.<sup>1</sup> This idea is where Ayala's scientific critique of

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<sup>1</sup>Dembski writes, "Claims that are refuted scientifically may be wrong, but they are not *necessarily* wrong—they cannot simply be dismissed out of hand. To see this, consider what would happen if microscopic examination revealed that every cell was inscribed with the phrase 'Made by Yahweh.' Or

ID becomes relevant to Dembski's scientific project. Ayala argues that Darwin's theory removed the criteria of *actual* design from the biological sciences. He does not argue that Darwin removed our ability to detect design within fields like engineering. In other words, human design can be detected, but not divine design. To determine whether Ayala's claim is sound, I compare his arguments with Dembski's challenge of Darwinism.

Dembski's third scientific task is to provide evidence that particular features in the natural world exhibit SC. This third task is crucial because, while Dembski's method might be correct, and while that method could theoretically apply to biology, it does not entail that there are actual examples of SC in biological systems. Dembski needs to further demonstrate that such examples exist. One of Dembski's most frequently cited examples is the existence of biological information within DNA.

### **ID as a Scientific Project**

Defending the science of ID begins with a methodological consideration regarding whether *design* is an appropriate mode of scientific explanation.<sup>2</sup> In many scientific disciplines, such as engineering or forensic science, the idea of *design* seems incontrovertible. When it comes to biology or the other natural sciences, however, ID is frequently dismissed as mere creationism or anti-evolution propaganda.<sup>3</sup> Such dismissals

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course cells don't have 'Made by Yahweh' inscribed on them, but that's not the point. The point is that we wouldn't know this unless we actually looked at cells under the microscope." William A. Dembski, "Science and Design," *First Things* 86 (1998): 21. Dembski argues in the preceding paragraph that the conclusion of ID may be incorrect, but that it should not be ruled out in principle.

<sup>2</sup>By design, I am referring to *actual* design rather than *apparent* design. In general, biologists recognize *apparent* design. Richard Dawkins is frequently cited as saying, "Biology is the study of complicated things that give the appearance of having been designed for a purpose." Richard Dawkins, *The Blind Watchmaker: Why the Evidence of Evolution Reveals a Universe without Design* (New York: W. W. Norton, 1996), 4.

<sup>3</sup>Dembski argues that ID is neither: "It is not my aim to guarantee creationism. Design, as I develop it, cuts both ways and might just as well be used to defeat creationism by clarifying the superfluity of design in biology. My aim is not to find design in any one place but to open up possibilities for finding

persist, even though ID advocates frequently emphasize that ID is consistent with what Ayala calls *the fact of evolution*.<sup>4</sup> Before one defends ID as a scientific research project, therefore, one must clarify what the project is and is not. Specifically, ID is *not* a critique of biological evolution.<sup>5</sup> Instead, it is fundamentally a claim that some events or objects bear the marks of actual design. Given this claim, many ID advocates argue that *design* should be considered an appropriate mode of explanation within science.

To establish ID's fundamental claim, Dembski begins by defining three possible modes of explanation: *chance*, *necessity*, and *design*. By *necessity*, Dembski refers to physical law-like relations between antecedent circumstances and consequent events. Necessity can be distinguished from chance in that necessity generates events or objects that are highly probable. By *chance*, Dembski refers to blind and undirected contingency. Such contingencies produce events or objects with an intermediate degree of probability. Chance, therefore, generates events or objects that are less probable than

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design as well as for shutting it down.” William A. Dembski, “The Third Mode of Explanation: Detecting Evidence of Intelligent Design in the Sciences,” in *Science and Evidence for Design in the Universe*, ed. Michael Behe, William Dembski, and Stephen Meyer (San Francisco: Ignatius, 2000), 20. Furthermore, ID is not an attack on evolution, but on Darwinism, which will be demonstrated in the body of this chap.

<sup>4</sup>The fact of evolution refers to the idea of common descent. Dembski maintains that one could trace every step of the evolutionary process, demonstrate that all life originated from a common ancestor, and it would not refute ID. See William A. Dembski and Jonathan Wells, *The Design of Life: Discovering Signs of Intelligence in Biological Systems* (Richardson, TX: The Foundation for Thought and Ethics, 2008), 140-42. See also chap. 2 for more details. Unfortunately, even though this point is often emphasized, ID thinkers obscure this issue in their writings. Dembski is no exception to this; in fact, he admits as much in his more recent work, *Being as Communion*. In a footnote, he admits that he can understand the confusion of critics when it comes to this issue: “Their criticisms are understandable because intelligent design advocates, myself included, haven’t always been as clear as we might in our use of design terminology, not clearly distinguishing external design from intelligence or teleology more generally.” William A. Dembski, *Being as Communion: A Metaphysics of Information* (Burlington, VT: Ashgate, 2014), 59.

<sup>5</sup>This is not to say that ID advocates embrace evolution. ID historian, Thomas Woodward, traces the origin of the ID movement back to Michael Denton’s *Evolution: A Theory in Crisis* and Phillip Johnson’s *Darwin on Trial*, works that challenge *the fact of evolution*. See Thomas Woodward, *Doubts about Darwin: A History of Intelligent Design* (Grand Rapids: Baker, 2003). Furthermore, in *The Design of Life* (Dembski and Wells’s textbook on ID), they also provide several critiques of common descent. See Dembski and Wells, *The Design of Life*, 60. One can understand, then, why critics pit ID against *the fact of evolution*.

events or objects that are produced by necessity. By *design*, Dembski refers to what he calls “directed contingency” or a superintending intelligence.<sup>6</sup> Given this definition, design generates events or objects that are highly improbable, complex, and specified.

The prevailing wisdom in most scientific disciplines, according to Dembski, is that chance and necessity are the only appropriate modes of scientific explanation.<sup>7</sup> This presumably puts ID proponents at a disadvantage when it comes to persuading scientists of design.<sup>8</sup> Dembski develops his case, therefore, by first clarifying how design is detected when it comes to everyday examples. He refers to an arrangement of stones on a mountainside that spell “Welcome to Wales by British Railways” as an example.<sup>9</sup> It

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<sup>6</sup>To get a full explanation of his distinctions between necessity, chance, and design, see William A. Dembski, “Signs of Intelligence: A Primer on the Discernment of Intelligent Design,” in *Signs of Intelligence: Understanding Intelligent Design*, ed. William Dembski and James Kushiner (Grand Rapids: Brazos, 2001), 172.

<sup>7</sup>I need to explicate further his proposed “third mode of explanation.” When it comes to the physical sciences, Dembski contends that scientists unnecessarily restrict themselves to two modes of scientific explanation, namely, chance and necessity. Dembski defines necessity as an event that will almost always happen and chance as a probable occurrence of an event, but one that is also compatible with some other event happening. See William A. Dembski, *The Design Inference: Eliminating Chance through Small Probabilities* (Cambridge, UK: Cambridge University Press, 1998), 8. In earlier works such as *The Design Inference*, Dembski uses the terms chance and regularity rather than chance and necessity. Throughout this dissertation, I use the terms “chance” and “necessity.” Dembski originally gets these categories from Jacques Monod. This means that when scientists attempt to provide an explanation for any event or object, they must appeal only to chance, necessity, or a combination of the two to be considered legitimate science. See William A. Dembski, *The Design Revolution: Answering the Toughest Questions about Intelligent Design* (Downers Grove, IL: InterVarsity, 2004), 9; and Jacques Monod, *Chance and Necessity* (New York: Vintage, 1972).

<sup>8</sup>Dembski writes, “My aim in *The Design Inference* was to rehabilitate design. I argue that design is a legitimate and fundamental mode of scientific explanation on a par with chance and necessity.” Dembski, “Signs of Intelligence,” 174.

<sup>9</sup>Dembski, *The Design Inference*, xi. Dembski also uses the examples of Mount Rushmore and rats running in a maze to illustrate this point. In the case of Mount Rushmore in western South Dakota, all three modes of explanation could be appropriate for explaining different features of the mountain. Necessity and chance provide a basic and general explanation for how the mountain originated in the first place. They do not, however, provide a good explanation for determining what caused four faces to emerge on the side of the mountain. To explain how the specific images of George Washington, Thomas Jefferson, Abraham Lincoln, and Theodore Roosevelt appear in the mountain, one needs a design explanation. To illustrate this point further, Dembski considers the ability of rats to run a maze. A psychologist studying the cognitive abilities of rats will construct a complicated maze and run a rat through it several times to see if the rat shows signs of learning. Each time the rat goes through the maze, if it appears to run through the maze quicker, taking less turns each time, the psychologist will likely determine that the rat is learning.

should not be controversial to say that such an arrangement of stones was produced by design. By admitting this, one is implying that neither chance nor necessity or the combination of the two have the available resources to explain the aforementioned arrangement. And if chance and necessity are negated, then design is the most plausible explanation.<sup>10</sup>

Dembski's stone illustration shows that design inferences are common in human experience. His goal in the illustration is to illuminate the process one subjectively works through in such inferences, and then articulate how such a process could be made objective.<sup>11</sup> Dembski highlights specific characteristics in the arrangement of stones that cause one to rightly infer design. He notes that the arrangement is highly improbable.<sup>12</sup> This is not initially surprising, however, since any arrangement of stones would be highly improbable. Dembski stresses that improbability by itself is not sufficient for detecting design. A high enough degree of improbability,

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This too is an application of ID, since the psychologist is using three modes of causal explanations to explain the rat's behavior. Some of the turns made by the rat may be determined by chance, but, as future experiments are conducted, the psychologist will use design as a mode of explanation to explain the rat's ability to learn.

<sup>10</sup>By appealing to design in such cases, one should note that this is not an argument for a specific designer, but a general designer. This means that appeals to design do not necessarily indicate who the designer was. When it comes to an English sentence like "Welcome to Wales by British Railways" one reasonably can infer that the designer was human. Of course, this inference is not certain. The designer could be an extraterrestrial intelligence who mastered the English language. The designer could also be supernatural. Such options seem unlikely, but the point is that inferences to design do not attempt to identify the designing agent.

<sup>11</sup>Dembski explains that he does not wish to simply *feel* like an event or object is designed. He wants to put numerical values on what constitutes a highly improbable event or object and thus make his design inference a non-subjective criteria. See Dembski, *The Design Inference*, 5.

<sup>12</sup>Dembski writes, "What counts as a small probability depends on an inquirer's interests and context for eliminating chance. Social scientists who set their alpha level at .05 or .01 are less stringent than criminal courts that establish guilt to a moral certainty and beyond reasonable doubt, and these in turn are less stringent than inflationary cosmologists as they account for the relative flatness of spacetime." Ibid., 6-7.

however, does eliminate necessity. This reduces our modes of explanation to either a chance explanation or a design explanation.<sup>13</sup>

Dembski then highlights that the particular arrangement of stones conforms to a pattern.<sup>14</sup> He notes that chance is able to generate some patterns and that chance and necessity working together can actually produce fairly complex patterns. The crucial question for Dembski, though, is whether the pattern of stones conforms to the right sort of pattern to eliminate chance.<sup>15</sup> He calls this *right sort of pattern* “specification” and argues that if a pattern is specified for a particular purpose, then one can rightly eliminate chance as well as the combination of chance and necessity. A proper elimination of chance and necessity makes it possible to objectively infer design, and Dembski argues that people intuitively and rightly make such inferences all the time.<sup>16</sup>

Broadly speaking, Dembski claims that his project has several scientific applications. In the preface of *The Design Inference*, he writes that the scope of his work applies to “forensic scientists, SETI researchers, insurance fraud investigators, debunkers of psychic phenomena, origins-of-life researchers, intellectual property attorneys, investigators of data falsification, cryptographers, parapsychology researchers, and

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<sup>13</sup>Dembski mentions that a designer can produce an event that is highly probable and thus disguise his or her design. This is not a problem for Dembski’s method, however, because his goal is to clarify when design can be correctly inferred. Certainly, there can be examples that are falsely attributed to chance or necessity due to the stealth nature of some designers.

<sup>14</sup>Dembski writes, “By pattern we shall mean any description that corresponds uniquely to some prescribed event.” Dembski, *The Design Inference*, 136. Dembski notes that there are two types of patterns. One is specification, where non-*ad hoc* patterns can legitimately be used to eliminate chance and warrant a design inference. The other is fabrication, where patterns are invented afterward and imposed on the data. An archer who shoots an arrow and only afterwards draws the target would constitute an improbable event that conforms to a particular pattern. That pattern is *ad hoc* and would constitute a fabrication. *Ibid.*, 5, 13.

<sup>15</sup>*Ibid.*, xi.

<sup>16</sup>Dembski notes that the concepts of complexity and specification are “well-defined information-theoretic concepts.” William A. Dembski, “Can Evolutionary Algorithms Generate Specified Complexity?” in *From Complexity to Life*, ed. Niels Gregersen (Oxford: Oxford University Press, 2003), 94.

programmers of (pseudo-) random number generators.”<sup>17</sup> Each of these examples illustrates the scientific significance of Dembski’s work, even if one does not consider it significant for biology.<sup>18</sup> In each example, he notes that design is the third mode of explanation that appropriately belongs in scientific discourse. His first step in defending this notion is to build a pre-theoretical case demonstrating that design is scientific in principle.<sup>19</sup>

### **The Science of Detecting Design**

Dembski develops a few different ways to articulate an objective inference to design. Most notable is his notion of SC or CSI, which is expressed using his Explanatory Filter. The Explanatory Filter is a flow chart that elucidates how one can distinguish between necessity, chance, and design. The chart begins with the question of contingency.<sup>20</sup> When considering any particular event E, the inquirer must ask whether E is a highly probable event? If the answer is yes, then E is not a contingent event, but rather a product of necessity. Dembski illustrates this point by considering the rolling of

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<sup>17</sup>Dembski, *The Design Inference*, xii. Some argue, however, that Dembski is wrong to consider such applications subsets of ID. Gary Hurd, for example, argues that forensic science “is like all other historical sciences in that practitioners rely on analogy, direct observation, replication, and the applications of basic sciences.” Gary S. Hurd, “Explanatory Filter, Archaeology, Forensics,” in *Why Intelligent Design Fails: A Scientific Critique of the New Creationism*, ed. Matt Young and Taner Edis (New Brunswick, NJ: Rutgers University Press), 116. He further argues that Dembski’s ID offers nothing to forensics, sense it does not have the resources to determine specific causes of death, and it cannot always distinguish between events where suicide or accident are equally likely. The problem with Hurd’s criticisms is that they try to get more out of the explanatory filter than Dembski intends. As I show later in this chapter, Dembski’s filter applies to adjudicating between different modes of explanation, not between specific explanations.

<sup>18</sup>Recognizing the various applications for Dembski’s method should alleviate the fear that ID is simply a repackaged form of biblical creationism.

<sup>19</sup>Dembski, “The Third Mode of Explanation,” 17. Here Dembski argues that philosophers and scientists throughout history have debated the applicability of each of these modes. Epicureans liked chance, Stoics emphasized design and necessity, Moses Maimonides emphasized design, Newton saw both necessity and design as legitimate explanations, and Laplace sought to rid astronomy of design.

<sup>20</sup>There are a few different versions of the explanatory filter; Dembski’s idea has developed over time.

a weighted die. The probability of rolling a six on a fair die is one in six. If the die is weighted in favor of rolling a six, however, the probability increases. Rolling a six with a weighted die, therefore, can be explained by an appeal to necessity rather than chance.

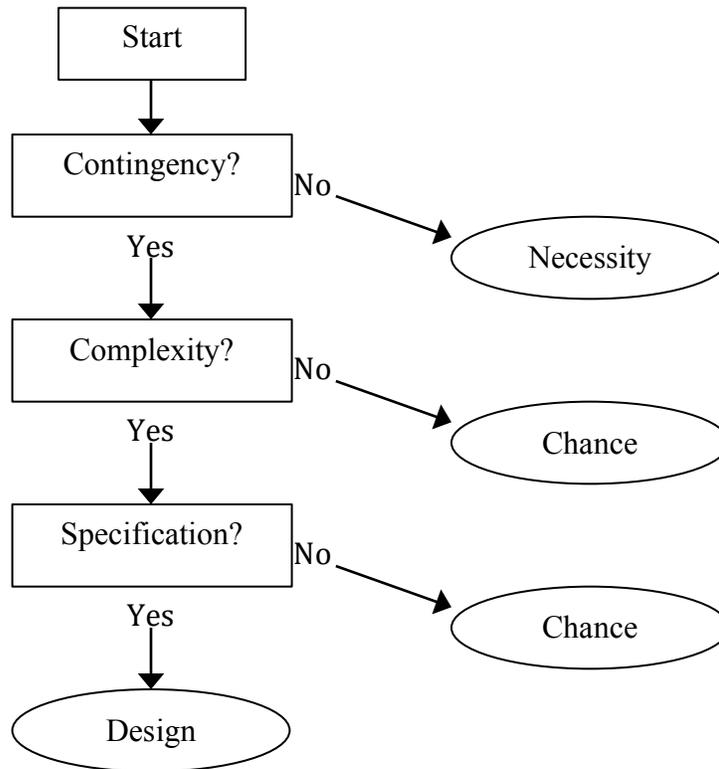


Figure 1. Explanatory filter

If one discovers that event E is not highly probable, however, then one can proceed to step 2 and ask the complexity question. Is event E an intermediately probable (IP) event? If yes, then the event is not complex and should therefore be considered a product of chance. Rolling a six using a fair die illustrates this second step. Since any role can be attributed to a one in six chance, rolling a six (event E) should also be considered a product of chance.

Suppose one discovers that event E does not have an intermediate level of probability. Dembski argues that one should proceed to step 3 and ask the specification question. Is event E one with small probability plus specification (sp/SP)? If yes, then one should consider E a product of design. Dembski calls this the Law of Small Probability, in which specified events of small probability do not occur by chance. He formulates the argument as follows:<sup>21</sup>

Premise 1: E has occurred.

Premise 2: E is specified.

Premise 3: If E is due to chance, then E has small probability.

Premise 4: Specified events of small probability do not occur by chance.

Premise 5: E is not due to a necessity.

Premise 6: E is due either to necessity, chance, or design.

Conclusion: E is due to design.

The formulation of this argument regards design as the elimination of chance, and chance is the elimination of necessity.<sup>22</sup>

A common criticism of ID argumentation, including Dembski's Explanatory Filter, is that it represents an argument from ignorance. Wesley Elsberry, for example, writes,

Dembski objects to critics' characterizing his EF/DI as an argument from ignorance. In response to such claims, he responds that arguments from ignorance have a logical structure of "not X, therefore Y," and that applying his EF/DI in analysis requires considerable knowledge. It is curious that Dembski himself lays out the "not X, therefore Y" structure of a fallacious argument as if his EF/DI were in some respect different. It is clear from *The Design Inference* and *No Free Lunch*, however, that Dembski's EF/DI is a deductive eliminative argument that demands

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<sup>21</sup>Dembski, *The Design Inference*, 48.

<sup>22</sup>Dembski writes, "We may think of design and chance as competing modes of explanation for which design prevails once chance is exhausted. In eliminating chance, the design inference eliminates not just a single chance hypothesis, but all relevant chance hypotheses." Ibid., 8. He further distinguishes the design inference (DI) from Bayes's theorem. Whereas Bayes's theorem attempts to confirm hypotheses, DI does not. There is no design hypothesis; rather, DI is purely eliminative. Ibid., 68.

acceptance of design when regularity [or necessity] and chance hypotheses of causation have been excluded. His formulation of design from *The Design Inference*, which has not been retracted, reads as follows:  $\text{des}(E) = \text{def } \sim\text{reg}(E) \ \& \ (\forall H) \sim\text{ch}(E|H) \ (1)$ .<sup>23</sup>

Elsberry concludes, “Simply stated, this equation says that an event is due to design if it is not due to regularity [necessity] and also is not due to chance, for all relevant chance hypotheses.”<sup>24</sup> In other words, Elsberry contends that Dembski’s argument is structured as an argument from ignorance.

Contra Elsberry, Dembski argues that his argument is not an argument from ignorance because it involves formulating and ascribing mathematical probabilities to particular events and objects set against relevant background information:

We need to know quite a bit to estimate likelihoods. It seems, therefore, inappropriate to describe what we are doing when we estimate likelihoods as “measuring ignorance.” Ignorance typically connotes a lack of knowledge that can be remedied, and should have been remedied, but wasn’t because of negligence. Estimating likelihoods in the light of relevant background information is nothing of the sort. When estimating likelihoods, we have typically remedied as much ignorance as we are able. What uncertainty remains is due not to negligence, but to the difficulties inherent in ruling out alternate possibilities.<sup>25</sup>

Dembski’s problem with calling this process an argument from ignorance is that it would entail that any appeals to design (including human design) could be attributed to ignorance. The relevant question for Dembski is not related to the particular structure of the argument. The relevant question is whether one can justify the Law of Small

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<sup>23</sup>Wesley Elsberry, “Logic and Math Turn to Smoke and Mirrors: William Dembski’s Design Inference,” in *Scientists Confront Intelligent Design and Creationism*, ed. Andrew Petto and Laurie Godfrey (New York: Norton & Company, 2007), 259-60.

<sup>24</sup>Elsberry, “Logic and Math Turn to Smoke and Mirrors,” 260.

<sup>25</sup>Dembski, *The Design Inference*, 82.

Probability.<sup>26</sup> In *The Design Inference*, he defends this law using probability and complexity theory.<sup>27</sup>

Dembski explains that complexity theory measures the difficulty of a problem to solve problem Q given certain resources R. He refers to the complexity of a padlock to illustrate this idea. It would be difficult for a person to open a padlock (Q) if she does not know the combination (R). She could certainly try, but given her resources, she will likely fail. On the other hand, it would not be difficult for a person to open a padlock (Q), assuming that she *does* know the combination (R). This illustrates the simple principle that difficulty goes up or down relative to the relevant resources, and the principle can be denoted by  $\Delta(Q|R)$ , with the range of numbers being 0 to  $\infty$ . So,  $\Delta(Q|R) = 0$  indicates minimal difficulty, whereas  $\Delta(Q|R) = \infty$  indicates maximal difficulty.<sup>28</sup> This formula makes the notion of complexity tangible, and, by providing a numerical method, Dembski demonstrates that his design inference is not subjective. Furthermore, Dembski's padlock example demonstrates how the elimination of chance and necessity is a responsible form of argumentation and not an argument from ignorance. The reason it is difficult for a person to open a padlock (Q) given that she does *not* know the combination, is because she would be relying only upon chance and necessity (R). And neither chance nor necessity nor the combination of the two have resources needed to easily open a padlock. If one knows the combination, however, then one can easily open the padlock because one is then relying upon design. Thus, when one reasons that the lock must have been opened by design, one is not arguing on the

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<sup>26</sup>Dembski defines this law as the idea that "specified events of small probability do not occur by chance." Ibid., 5.

<sup>27</sup>Ibid., 92.

<sup>28</sup>Dembski, *The Design Inference*, 100.

basis of ignorance. Rather, one is basing this intuition upon the knowledge of resources needed to accomplish the task of unlocking the padlock with minimal difficulty.<sup>29</sup>

Another common objection to Dembski's method is found in the anthropic principle, which he calls the *inventing probabilistic resources* objection.<sup>30</sup> In short, this objection states that if an event X seems incredibly improbable given our current understanding of the world, then one must introduce an additional chance hypothesis that will have the ability to increase one's probabilistic resources.<sup>31</sup> To understand this objection, one could think of the improbability of winning the lottery. The chances of any particular person winning the lottery are incredibly low. When a person does win the lottery, however, it is not automatically inferred that the lottery was rigged (or designed). Rather, one must consider the full extent of one's probabilistic resources, and recognize that someone was bound to win the lottery by chance given that there are millions of people who play the lottery every week. In the same way, many have argued that we should not conclude too quickly that the various examples of SC are the result of design simply because such examples are highly improbable.

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<sup>29</sup>Dembski provides details in *The Design Inference* that are too involved to cover in this chap. He specifically seeks to demonstrate that specificity and highly improbable events can be quantified, even if there is an aspect of subjectivity. Dembski notes that all statistics involve subjectivity when applying numerical values to particular events: "To define probability as the best available estimate of likelihood is therefore to embrace fallibilism and progressivism as ineliminable aspects of probability. How we determine the best available estimate of the likelihood of an event is in the end a function of our accumulated knowledge for dealing with uncertainty. Such knowledge consists of norms and practices that are constantly being corrected and refined. Such knowledge arises within a community of discourse and reflects the practices of those judged by the community as expert in the estimation of likelihoods. As the best available estimate of the likelihood of an event in the light of relevant background information, the probability of an event is the estimate on which this group of experts agrees. What gets assigned as the probability of an event is therefore historically contingent. I offer no algorithm for assigning practical purposes it suffices that a community of discourse can settle on a fixed estimate of likelihood." *Ibid.*, 87.

<sup>30</sup>William A. Dembski, *No Free Lunch: Why Specified Complexity Cannot Be Purchased without Intelligence* (Lanham, MD: Rowman & Littlefield, 2002), 85.

<sup>31</sup>Dembski notes that astrophysicist Brandon Carter coined the term in 1970: "In its original formulation, the Anthropic Principle merely states that the physical laws and fundamental constants that structure the universe must be compatible with human observes. Since human observes exist, the principle is obviously true." William A. Dembski, "The Design Argument," in *Science & Religion: A Historical Introduction*, ed. Gary Ferngren (Baltimore: Johns Hopkins University Press, 2002), 339.

One could apply the aforementioned lottery illustration to the improbability of the origin of life on earth. Given our current knowledge and understanding of the universe, the odds of life originating on our planet are astronomically low. If one invents additional probabilistic resources, however, one could imagine how life might have occurred by chance. Dawkins, for example, writes,

The anthropic alternative to the design hypothesis is statistical. Scientists invoke the magic of large numbers. It has been estimated that there are between 1 billion to 30 billion planets in our galaxy, and about 100 billion galaxies in the universe. Knocking a few noughts off for reasons of ordinary prudence, a billion billion is a conservative estimate of the number of available planets in the universe. Now, suppose the origin of life, the spontaneous arising of something equivalent to DNA, really was a quite staggeringly improbable event. Suppose it was so improbable as to occur on only one in a billion planets. A grant-giving body would laugh at any chemist who admitted that the chance of his proposed research succeeding was only one in a hundred. But here we are talking about odds of one in a billion. And yet . . . even with such absurdly long odds, life will still have arisen on a billion planets—of which Earth, of course, is one.<sup>32</sup>

Dawkins’s argument initially seems persuasive. One can easily reason that the known universe is only a tiny fraction of the actual universe. One could even reason that there are multiple universes. It does not take much imagination to think of any number of entities, processes, or factors outside of the known universe that would increase probabilistic resources, and thus allow one to attribute the improbability of life’s origin to chance. Dembski calls such factors “Z-factors,” and his response to this objection is compelling:

[The Z-factors] considered here allow for unlimited probabilistic resources. Now the problem with unlimited probabilistic resources is that they allow us to explain absolutely everything by reference to chance—not just natural objects that actually did result by chance and not just natural objects that look designed, but also all artificial objects that are in fact designed. In effect, unlimited probabilistic resources collapse the distinction between apparent design and actual design and make it impossible to attribute anything with confidence to actual design.<sup>33</sup>

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<sup>32</sup>Richard Dawkins, *The God Delusion* (New York: Houghton Mifflin, 2006), 165.

<sup>33</sup>Dembski, *No Free Lunch*, 93.

He continues to argue that there is “no principled way to discriminate between using unlimited probabilistic resources to retain chance and using specified complexity to eliminate chance.”<sup>34</sup> In other words, those who add Z-factors have determined that design is not an appropriate Z-factor. For them, the only appropriate Z-factors are those consistent with an unguided and non-teleological perspective on reality. But if those Z-factors are correct, then Dembski’s response is that they allow everything to reasonably be attributed to chance, which would include rock formations that spell “Welcome to Wales by British Railways.”

Dembski’s project up until this point is certainly insightful and useful, but I should pause briefly to consider whether Dembski is really pursuing a scientific research project. Much of the criticisms directed toward ID are that ID advocates are not engaging in scientific argumentation. In other words, if ID advocates would simply admit that their projects are religious or philosophical in nature, then there would presumably be less controversy.

I am currently undecided as to whether certain aspects of ID should be considered scientific in principle and to address this issue responsibly would require additional chapters engaging literature within the philosophy of science. I will argue, however, that Dembski’s arguments should be classified as the same types of arguments as those used by Ayala. As seen in chapter 2, Ayala maintains that Darwin’s great accomplishment was to provide a “scientific explanation of design.”<sup>35</sup> This seems to suggest that Ayala regards Darwin’s accomplishment of providing a scientific explanation of design as a *scientific accomplishment*. In other words, Darwin’s accomplishment, according to Ayala, was not “merely” a philosophical, metaphysical, or theological accomplishment. For the purposes of this dissertation, I am not concerned

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<sup>34</sup>Dembski, *No Free Lunch*, 96.

<sup>35</sup>Francisco J. Ayala, *The Big Questions: Evolution* (London: Quercus, 2012), 47.

with whether or not Ayala's language provides a proper demarcation of scientific accomplishments, only that one recognize that Ayala and Dembski are making the same types of arguments. If one regards Ayala's arguments as scientific in principle, one should equally regard Dembski's arguments as scientific in principle. On the other hand, if one contends that Dembski's arguments are more philosophical than scientific, then he should also contend that Ayala's arguments are philosophical as well. The relevant issue for this dissertation is not to make careful demarcations concerning the meaning and scope of science, but simply to treat each thinker fairly.

### **ID as Biological Science**

For the aforementioned reasons, I consider Dembski as pursuing the same type of arguments as Ayala, whether one regards these arguments as scientific or not. Acknowledging this says nothing about who has the better arguments nor does it say anything about whether Dembski's method for detecting design has been substantiated. To properly analyze the details and quality of Dembski's argument requires the work of qualified mathematicians and statisticians, and, hence, I leave that work for those who are more qualified.

The next relevant question for this chapter, then, is whether Dembski's design inference can, in principle, apply to biology. Dembski claims that it does and that it provides an alternative to Darwinism.<sup>36</sup> When applied to biology, the fundamental claim of ID is that "intelligent causes are necessary to explain the complex, information-rich structures of biology and that these causes are empirically detectable."<sup>37</sup> In making this

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<sup>36</sup>Dembski, "The Design Argument," 341. Dembski treats Darwinism as a worldview, and thus must be distinguished from the theory of evolution.

<sup>37</sup>Ibid. Dembski explains how this is different than Darwinism: "Evolutionary biology teaches that all biological complexity is the result of material mechanisms. These include, principally, the Darwinian mechanism of natural selection and random variation, but they also include other mechanisms (symbiogenesis, gene transfer, genetic drift, the action of regulatory genes in development, self-organizational processes, etc.). These mechanisms are just that: mindless material mechanisms that do what they do irrespective of intelligence. To be sure, mechanisms can be programmed by an intelligence.

claim, ID challenges a purely naturalistic approach to biology. Of course, this does not mean that ID ignores the reality of natural causes in biology. Dembski does not deny mechanisms like random mutation and natural selection; rather, he argues that such mechanisms are not sufficient to explain the whole diversity of life.<sup>38</sup> And given that random mutation (chance) and natural selection (necessity) are not sufficient, Dembski further argues that teleological explanations (design) should be acknowledged in biology:

For many in the scientific community, natural causes are at heart non-teleological and therefore unintelligent. Natural causes, when suitably coordinated, may exhibit intelligence. Thus, animals might be viewed as purely natural objects that act as intelligent causes to achieve ends. But the teleology they exhibit is, from a naturalistic perspective, the result of a long and blind evolutionary process whose nuts-and-bolts causal processes are non-teleological. Given naturalism, natural causes bring about intelligent causes but are not themselves intelligent. On this view, intelligent causes are always reducible to non-teleological natural causes, ultimately to the motions and interactions of particles governed by forces of attraction and repulsion.<sup>39</sup>

Dembski highlights a crucial issue in this paragraph. Very few scientists will deny all examples of teleology. Even atheist scientists explain rock formations that spell English sentences by appealing to design. These scientists do not argue that cars, computers, books, or buildings are generated by chance and necessity. For the Darwinist, however,

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But any such intelligent programming of evolutionary mechanisms is not properly part of evolutionary biology. Intelligent Design, by contrast teaches that biological complexity is not exclusively the result of material mechanisms but also requires intelligence, where the intelligence in question is not reducible to such mechanisms.” William Dembski, “The Logical Underpinnings of Intelligent Design,” in *Debating Design: From Darwin to DNA*, ed. William Dembski and Michael Ruse (New York: Cambridge University Press, 2004), 323.

<sup>38</sup>Dembski explains, “Darwinism is really two claims. The less crucial claim is that all organisms trace their lineage back to a universal common ancestor . . . . This claim is referred to as ‘common descent.’ Although evolutionary biology is committed to common descent, that is not its central claim. Rather, the central claim of evolutionary biology is that an unguided physical process can account for the emergence of all biological complexity and diversity. Filling in the details of that process remains a matter for debate among evolutionary biologists.” William Dembski, “The Myths of Darwinism,” in *Uncommon Dissent: Intellectuals Who Find Darwinism Unconvincing*, ed. William Dembski (Wilmington, DE: Intercollegiate Studies Institute, 2004), xx.

<sup>39</sup>William Dembski and Robert Marks II, “Life’s Conservation Law: Why Darwinian Evolution Cannot Create Biological Information,” in *The Nature of Nature: Examining the Role of Naturalism in Science*, ed. Bruce Gordon and William Dembski (Wilmington, DE: Intercollegiate Studies Institute, 2011), 363.

all teleological causes are ultimately reduced to non-teleological physical processes. This means that any intelligence—whether human or animal intelligence—is fundamentally the result of blind evolutionary processes.<sup>40</sup> Thus Darwinism must explain all examples of design in the world by reducing them to chance and necessity or the combination of the two. A suggestion like this, however, undermines the intelligence needed to make scientific discoveries in the first place. Dembski ironically contends that the naturalism associated with Darwinian evolution leads to the destruction of scientific inquiry.<sup>41</sup>

In addition to the epistemological problems with Darwinian naturalism, Dembski argues that ID is relevant for biology because it provides a better explanation for biological information.<sup>42</sup>

The central issue in the scientific debate over intelligent design and biological evolution can therefore be stated as follows: Is nature complete in the sense of possessing all the resources it needs to bring about the information-rich biological structures we see around us, or does nature also require some contribution of design to bring about those structures? Darwinian naturalism argues that nature is able to create all its own information and is therefore complete. Intelligent design, by contrast, argues that nature is merely able to re-express existing information and is therefore incomplete.<sup>43</sup>

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<sup>40</sup>Dembski and Marks, “Life’s Conservation Law,” 364.

<sup>41</sup>Again, similar arguments have been made by various Christian and non-Christian thinkers. Alvin Plantinga, for example, provides a persuasive defense of this argument in his evolutionary argument against naturalism (EAAAN). For details, see Alvin Plantinga, *Where the Conflict Really Lies: Science, Religion, and Naturalism* (New York: Oxford University Press, 2011). See also Thomas Nagel, *Mind & Cosmos: Why the Materialist Neo-Darwinian Conception of Nature is Almost Certainly False* (New York: Oxford University Press, 2012).

<sup>42</sup>Particularly, Dembski has in mind the kind of information that is represented by SC. If there are biological examples that exhibit SC, Dembski argues that natural causes would not be able to explain them. This is not just the case due to the fact of being able to provide an example of natural causes generating SC, but it is true in principle. He distinguishes SC from Shannon information, which is more concerned with determining the improbability or complexity of a particular string of characters. Though SC takes Shannon’s information into account, it also considers the patterning or significance of the characters in question.

<sup>43</sup>Dembski, “Life’s Conservation Law,” 362. Dembski utilizes Behe’s concept of irreducible complexity in organisms like the bacterial flagellum. He argues that Darwinian mechanisms cannot produce such structures: “Given a pre-specified goal, selection has no difficulty producing irreducibly complex systems. But the selection operating in biology is Darwinian natural selection. And by definition this form of selection operates without goals, has neither plan nor purpose, and is wholly undirected. The

The case for ID in biology, for Dembski, is a case regarding the origin of biological information. Information is presumably what distinguishes the organic from the inorganic, and Dembski claims that naturalistic mechanisms are not able to produce the information needed to create life.<sup>44</sup> To argue for ID in biology, therefore, one must demonstrate that neither chance nor necessity nor the combination of the two can bridge the gap between the organic and inorganic worlds. Dembski maintains that this lack of a bridge can be demonstrated, and writes that one of the great myths of Darwinism is that biological information can be purchased without intelligence.<sup>45</sup>

Ayala promotes this Darwinian idea as articulated by Dembski. As seen in chapter 2, he argues that natural selection working upon random mutations is capable of explaining the totality of life. This implies that chance and necessity have sufficient resources to generate biological information. Ayala writes,

Chance is . . . an integral part of the evolutionary process. The mutations that yield the hereditary variations available to natural selection arise at random, independently of whether they are beneficial or harmful to their carriers. This

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great appeal of Darwin's selection mechanism was, after all, that it would eliminate teleology from biology. Yet by making selection an undirected process, Darwin drastically reduced the type of complexity biological systems could manifest. Henceforth biological systems could manifest only cumulative complexity, not irreducible complexity." Dembski, "Science and Design," 25.

<sup>44</sup>Dembski is not even suggesting that naturalistic mechanisms are irrelevant for all biological structures: "Not all biological structures or arrangements are equally relevant to deciding whether life is designed. For instance, Darwin's mechanism of natural selection acting on random variation is responsible for certain features of biological systems. Antibiotic resistance in bacteria and insecticide resistance in insects can be readily accounted for in terms of the Darwinian mechanism." Dembski, *The Design Revolution*, 139-40. Dembski overemphasizes the point that ID does not negate naturalistic mechanisms, and he illustrates the point by referencing the design of a rusted old automobile, which bears the marks of design (engineering) and natural forces (weathering and corrosion). Similarly, biological systems could be expected to reveal design, chance, and necessity.

<sup>45</sup>Dembski, *No Free Lunch*, 148. Dembski further argues that Darwin's main claim to fame is that he supposedly provided a mechanism that could create information without the need for intelligence. See Dembski, "Life's Conservation Law," 361. Elsewhere, he writes, "Darwin's claim to fame was to propose natural selection as a designer substitute. But natural selection is no substitute for intelligent coordination. All natural selection does is narrow the variability of incidental change by weeding out the less fit. What's more, it acts on the spur of the moment, based solely on what the environment at present deems fit, and thus without any foresight of future possibilities. And yet this blind process, when coupled with another blind process (incidental change), is supposed to produce designs that exceed the capacities of any designers in our experience." Dembski, "Myths of Darwinism," xxi.

random process (as well as others that come to play in the great theatre of life) is counteracted by natural selection, which preserves what is useful and eliminates the harmful. Without mutation, evolution could not happen because there would be no variations that could be differentially conveyed from one to another generation. Without natural selection, the mutation process would yield disorganization and extinction because most mutations are disadvantageous. Mutation and selection have jointly driven the marvelous process that starting from microscopic organisms has spurred orchids, birds and humans.<sup>46</sup>

He continues,

The theory of evolution manifests chance and necessity jointly intertwined in the stuff of life; randomness and determinism interlocked in a natural process that has brought forth the most complex, diverse, and beautiful entities in the universe: the organisms that populate the earth, including humans who think and love, endowed with free will and creative powers, and able to analyze the process of evolution itself that brought them into existence. This was Darwin's fundamental discovery, that there is a natural process that is creative, though not conscious.<sup>47</sup>

For Ayala, chance and necessity working together can produce biological information without intelligence. To challenge this Darwinian notion, Dembski contends that no one has produced a theoretical model to substantiate Ayala's claim. He then reviews and critiques various evolutionary algorithms, concluding that such algorithms actually assume ID rather than negate it.

Dawkins, for example, introduces his evolutionary algorithm in *The Blind Watchmaker* to illustrate how random mutation and natural selections could even produce a Shakespearian sentence like METHINKS IT IS LIKE A WEASEL.<sup>48</sup> Dawkins sought to demonstrate this by entering a random sequence of 28 letters (WDLMNLT DTJBKWIRZREZLMQCOP) into a computer program designed to illustrate the effects

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<sup>46</sup>Ayala, "Chance and Necessity: Adaptation and Novelty in Evolution," in *Evolving Dialogue*, ed. J. B. Miller (Harrisburg, PA: Trinity, 2001), 238.

<sup>47</sup>Ibid.

<sup>48</sup>Dawkins, *The Blind Watchmaker*, 66.

of natural selection acting upon random mutations.<sup>49</sup> He explains the details of the program's procedures as follows:

[The sequence of letters] "breeds from" this random phrase. It duplicates it repeatedly, but with a certain chance of random error—"mutation"—in the copying. The computer examines the mutant nonsense phrases, the progeny of the original phrase, and chooses the one which, *however slightly*, most resembles the target phrase, METHINKS IT IS LIKE A WEASEL. In this instance the winning phase of the next "generation" happened to be: WDLTMNLT DTJBSWIRZREZLMQCOP. Not an obvious improvement! But the procedure is repeated, again mutant "progeny" are "bred from" the phrase, and a new "winner" is chosen. This goes on, generation after generation.<sup>50</sup>

According to this particular run, Dawkins notes that the random sequence evolved into the target sequence in just 43 generations. This presumably shows that the ingredients of time, chance, and necessity can all work together to produce an example of SC. No design is needed.

Dembski rightly notes, however, that Dawkins's program does not disprove teleology but rather assumes it. Dembski writes,

Does Dawkins's evolutionary algorithm demonstrate the power of the Darwinian mechanism to create biological information? No. Clearly, the algorithm was stacked to produce the outcome Dawkins was after. Indeed, because the algorithm was constantly gauging the degree of difference between the current sequence from the target sequence, the very thing that the algorithm was supposed to create (i.e., the target sequence METHINKS IT IS LIKE A WEASEL) was in fact smuggled into the algorithm from the start.<sup>51</sup>

In other words, Dawkins's evolutionary algorithm demonstrates evolution needs four ingredients to produce a line of Shakespeare: time, chance, necessity, and design. This is

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<sup>49</sup>Dawkins, *The Blind Watchmaker*, 68.

<sup>50</sup>Ibid.

<sup>51</sup>Dembski, "Life's Conservation Law," 366-67.

not Darwinism, it is a particular version of ID. At best, evolutionary algorithms can demonstrate teleological evolution.<sup>52</sup>

### Ayala's Critique and Dembski's Method

In chapter 2, I showed that Ayala's first four scientific critiques center on the claim that ID is in conflict with evolution. The nuances of Dembski's work, however, demonstrate that this is not true, depending upon how one defines evolution.<sup>53</sup> Ayala's fifth scientific critique, though, did offer a specific response to Dembski's method for detecting design. Now that I have summarized some of Dembski's contributions to ID, I can assess each of Ayala's scientific critiques more fully.

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<sup>52</sup>Dembski offers a more specific refutation of Dawkins: "In WEASEL, Dawkins starts with a blind search whose probability of success in one query is roughly 1 in  $10^{40}$ . This is  $p$ . He then implements an alternative search (his evolutionary algorithm) whose probability of success in a few dozen queries is close to 1. This is  $q$ . Dawkins leaves the discussion hanging, as though having furnished an evolutionary algorithm that locates the target phrase with high probability (which we are calling  $S$ ), he has demonstrated the power of Darwinian processes. But in fact all he has done is shifted the problem of locating the target elsewhere . . . . Thus, in furnishing an alternative search whose probability of success is  $q$ , he incurred a probability of cost  $p$  of finding the right fitness function, which coincides (not coincidentally) with the original improbability of the null search finding the target. The information problem that Dawkins purported to solve is therefore left completely unresolved!" Dembski, "Life's Conservation Law," 372. Dembski also considers other evolutionary algorithms, such as Christoph Adami's AVIDA, Thomas Ray's Tierra, and Thomas Schneider's *ev*. Each of these programs are meant to demonstrate the power of natural selection and random mutation. Dembski argues that the main problem with these programs is that they "capitalize on ignorance of how information works. The information hidden in them can be uncovered through a quantity we call *active information*. Active information is to information accounting what the balance sheet is to financial accounting." Ibid. Additionally, Dembski refers to MESA, Mendel's Accountant, and MutationWorks as ID-produced programs meant to demonstrate the inefficiency of the Darwinian mechanism to produce SC.

<sup>53</sup>Dembski provides a helpful illustration regarding how natural processes and design could work together: "Imagine an embossed sign that reads *Eat at Frank's* falls over in a snowstorm and leaves the mirror image of *Eat at Frank's* embedded in the snow. Granted, the sign fell over as a result of undirected natural forces, and on that basis the impression the sign left in the snow would not be attributed to design by the [explanatory] filter. Nonetheless, there is a relevant event whose design needs to be assessed, namely, the structuring of the embossed image (whether in the snow or on the sign). This event must be referred back to the activity of the sign's maker, and the Explanatory Filter properly ascribes it to design. Natural forces can serve as conduits of design. As a result, a simple inspection of those natural forces may turn up no evidence of design. Often one must look deeper." Dembski, *The Design Revolution*, 91.

## Paley, Darwin, and Natural Theology

Ayala started his critique against ID by arguing that Darwin overturned the design argument that was articulated and popularized by Paley, and thus completed the scientific revelation.<sup>54</sup> He further maintains that the modern ID movement is simply an attempt to rehash the design argument that Darwin disproved. Dembski is certainly familiar with the Paley-to-Darwin history, and it is not surprising that he interprets the history of design arguments differently than Ayala. For Ayala, notions of teleology are restricted to natural theology. While natural theology has produced key insights into teleology, Dembski highlights that design arguments are not unique to Christianity:

Often the design argument and a metaphysical commitment to design have operated in tandem. This has been especially true in the Christian tradition, in which the design argument is used to establish an intelligent cause, and a metaphysical commitment to God then identifies that intelligent cause with God. The design argument and a metaphysical commitment to design have also tended to be conflated within the Christian tradition, so that the design argument often appears to move directly from features of the physical world to the triune God of Christianity.<sup>55</sup>

Although Dembski is part of the Christian tradition and an advocate for natural theology, he further explains,

Full-fledged design arguments have been available since classical times. Both Aristotle's (384-322 B.C.) final causes and the Stoics' seminal reason were types of intelligent causation inferred at least in part from the apparent order and purposiveness of the physical world. For example, in *De natura deorum (On the Nature of the Gods)*, Cicero (106-43 B.C.) writes: "When we see something moved by machinery, like an orrery or clock, . . . we do not doubt that these contrivances are the work of reason; when therefore we behold the whole compass with perfect

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<sup>54</sup>Dembski references Ayala on this point in a discussion he had with Michael Ruse: "I think we need to be very clear what we are talking about with evolutionary theory. We're not talking about a guided form of evolution in which God or some intelligence was controlling the process in some substantive way where we can see clear, empirically detectable marks of that intelligence. What is meant by evolution is a process that, for all our scientific investigation can reveal, did not require any intelligence. Francisco Ayala, for instance, describes what he calls 'Darwin's Greatest Achievement' as showing how you get the organization of living forms apart from any design or creative intelligence." William A. Dembski and Michael Ruse, "Intelligent Design: A Dialogue," in *Intelligent Design: William A. Dembski & Michael Ruse in Dialogue*, ed. Robert B. Stewart (Minneapolis: Fortress, 2007), 13.

<sup>55</sup>Dembski, "The Design Argument," 336.

regularity the annual changes of the seasons with absolute safety and security for all things, how can we doubt that all this is effected not merely by reason, but by a reason that is transcendent and divine?" (Cicero 1933, 217-19).<sup>56</sup>

Here Dembski notes that design, as a mode of explanation, dates back to Aristotle's distinctions between material, efficient, formal, and final causes. Those distinctions are commonly illustrated using Michelangelo's *Statue of David*. The material cause of *David* is the marble used in its construction. The efficient cause is chipping the marble slab with a hammer and chisel. The formal cause is that the structure represents David rather than a random block of marble. The final cause is the purpose of *David*, namely, to produce a work of art.<sup>57</sup> Dembski, though not a full supporter of Aristotle's four causes, notes that each cause used to be significant when it came to natural philosophy. In modern science, however, the rules of science changed due to insights offered by Francis Bacon, who rejected notions of formal and final causes within scientific investigation.<sup>58</sup>

Dembski mentions this history to contend that the ID movement should not be reduced to a nineteenth-century discussion regarding merits of natural theology. Intelligent design, for Dembski, is a scientific argument. One reason ID is not recognized within the scientific establishment, according to Dembski, is that the current rules of science restrict scientific explanation to chance or necessity or the combination of the

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<sup>56</sup>Dembski, "The Design Argument," 336.

<sup>57</sup>William A. Dembski, "The Third Mode of Explanation: Detecting Evidence of Intelligent Design in the Sciences," in *Science and Evidence for Design in the Universe*, ed. Michael Behe, William Dembski, and Stephen Meyer (San Francisco: Ignatius, 2000), 20-21.

<sup>58</sup>Dembski notes further that Jacques Monod's *Chance and Necessity* represents a modern version of Bacon's thought. For Monod, chance and necessity alone "suffice to account for every aspect of the universe." Dembski, "The Third Mode of Explanation," 21. Dembski also writes, "Throughout the centuries theologians have argued that nature exhibits features that nature itself cannot explain but that instead require an intelligence beyond nature. From church fathers like Minucius Felix and Gregory of Nazianzus (third and fourth centuries) to medieval scholars like Moses Maimonides and Thomas Aquinas (twelfth and thirteenth centuries) to Reformed thinkers like Thomas Reid and Charles Hodge (eighteenth and nineteenth centuries), we find theologians making design arguments, arguing from the data of nature to an intelligence that transcends nature. Design arguments are old hat. Indeed, design arguments continue to be a staple of philosophy and religion courses. The most famous of the design arguments is William Paley's watchmaker argument." William A. Dembski, "What Every Theologian Should Know about Creation, Evolution & Design," in *Unapologetic Apologetics: Meeting the Challenges of Theological Studies*, ed. William Dembski and Jay Wesley Richards (Downers Grove, IL: InterVarsity, 2001), 223.

two. Such rules trace their origin to Bacon's insights, but Dembski claims that these restrictions are neither necessary nor reasonable.

Dembski additionally maintains that while Paley's *Natural Theology* and the central claims of ID are related, they are also distinct academic pursuits:

It is the empirical detectability of intelligent causes that renders intelligent design a fully scientific theory and distinguishes it from the design arguments of philosophers, or what has traditionally been called *natural theology*. Natural theology reasons from the data of nature directly to the existence and attributes of God . . . . Perhaps the weakest part of Paley's *Natural Theology* was his closing chapter where he sings the praises of nature's delicate balance and how only a beneficent deity could have arranged so happy a creation. Darwin turned this argument on its head, focusing instead on the brutality of nature and seeing anything but the hand of a beneficent deity.<sup>59</sup>

Dembski interestingly agrees with Ayala, contending that Darwin turned Paley's argument on its head regarding the brutality of nature. He even agrees that Darwin delivered the greatest blow to the design argument.<sup>60</sup> What makes ID different than Paley's natural theology, however, is ID's theological neutrality. Dembski writes that ID "resists speculating about the nature, moral character or purposes of [the designer]."<sup>61</sup> This means that the brutality of nature does not negate the reality of teleology. At best, it undermines the goodness of the designer. Such a complaint, however, is a theological rather than a scientific complaint.

### **General Evolution and Human Evolution**

As mentioned in chapter 2, ID is not incompatible with *the fact of evolution*. To quote Dembski again: "Logically, intelligent design is compatible with everything from utterly discontinuous creation (e.g., God intervening at very conceivable point to create new species) to the most far-ranging evolution (e.g., God seamlessly melding all

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<sup>59</sup>Dembski, "What Every Theologian Should Know about Creation, Evolution & Design," 225.

<sup>60</sup>Dembski, "The Design Argument," 338-39.

<sup>61</sup>Dembski, "What Every Theologian Should Know," 225.

organisms together into one great tree of life).”<sup>62</sup> This admission alone is enough to demonstrate that Ayala’s defense of general and human evolution is irrelevant when it comes to the debate over ID. Dembski frequently contends that *the fact of evolution* and claims of ID are fully compatible.<sup>63</sup>

### **The Power of Natural Selection**

The fourth step in Ayala’s scientific critique of ID highlights where Dembski’s scientific project and Ayala’s theistic evolution part ways. While Dembski does not deny the significance of natural selection in driving the evolutionary process, he does view it as severely limited:

There is no question that Darwin’s mutation-selection mechanism constitutes a fruitful idea for biology and one whose fruits have yet to be fully plundered. But Darwinism is more than just this mechanism. Darwinism is the totalizing claim that this mechanism accounts for all the diversity of life. The evidence simply doesn’t support this claim.<sup>64</sup>

Dembski and Ayala, therefore, disagree regarding *the mechanisms of evolution*. This is one aspect of evolution, however, that Ayala admits is legitimately debated among scientists. Even so, he contends that debates regarding the mechanisms of evolution should be restricted to non-teleological mechanisms, whereas ID advocates make no such restrictions. Dembski explains that this is what makes ID different than theistic evolution:

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<sup>62</sup>Dembski, “What Every Theologian Should Know,” 227.

<sup>63</sup>Of course, this does not mean that Dembski personally subscribes to *the fact of evolution*. He writes, “The following problems have proven utterly intractable not only for the mutation-selection mechanism but also for any other undirected natural process proposed to date: the origin of life, the origin of the genetic code, the origin of multicellular life, the origin of sexuality, the scarcity of transitional forms in the fossil record, the biological big bang that occurred in the Cambrian era, the development of complex organ systems and the development of irreducibly complex molecular machines. These are just a few of the more serious difficulties that confront every theory of evolution that posits only undirected natural processes.” *Ibid.*, 231. Note, however, that Dembski specifically points out that the aforementioned difficulties are difficulties for “undirected natural processes.” One could argue this idea is fully consistent with *the fact of evolution* if teleological mechanisms were regarded as appropriate modes of explanation.

<sup>64</sup>*Ibid.*, 230.

Intelligent design is incompatible with what typically is meant by theistic evolution. Theistic evolution takes the Darwinian picture of the biological world and baptizes it, identifying this picture with the way God created life. When boiled down to its scientific content, however, theistic evolution is no different from atheistic evolution, treating only undirected natural processes in the origin and development of life. Theistic evolution places *theism* and *evolution* in an odd tension. If God purposely created life through Darwinian means, then God's purpose was to make it seem as though life was created without purpose. Within theistic evolution, God is a master of stealth who constantly eludes our best efforts to detect him empirically. Yes, the theistic evolutionist believes that the universe is designed. Yet insofar as there is design in the universe, it is design we recognize strictly through the eyes of faith. Accordingly, the natural world in itself provides no evidence that life is designed. For all we can tell through our natural intellect, our appearance on planet earth is an accident.<sup>65</sup>

This passage shows how theological issues are inescapable in the debate between Darwinism and ID. Ayala assumes that unguided evolution is the scientific way to view the world, and teleological explanations are therefore necessarily unscientific. Yet this view relies upon a particular theology, which suggests that design could never be detected in principle. Such a theology implies that God created a world that does not bear the marks of design.<sup>66</sup> According to Dembski, Ayala's God is a "stealth designer."<sup>67</sup>

### Conclusion

The fundamental difference between Ayala and Dembski is over the issue of teleology. Dembski argues that teleology exists and is discernable in nature. Ayala, on the other hand, argues that Darwin's great accomplishment was to rid teleology from scientific inquiry. Darwin's alleged accomplishment, however, was not, in principle, a scientific one, but rather a metaphysical or theological one. When considering Dembski's work on design detection, it becomes clear that Dembski does not deny

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<sup>65</sup>Dembski, "What Every Theologian Should Know," 228.

<sup>66</sup>Of course, if one were an atheist, one would argue that the world is not designed because there is no designer. This is also a theological claim that rules out design in principle.

<sup>67</sup>Dembski, *The Design Revolution*, 7.

Darwin's proposal that natural selection operates upon random mutations. Rather, he denies the Darwinian claim that natural selection and random mutations are the only relevant mechanisms for explaining the full diversity of life. But, of course, even Ayala agrees with Dembski on this point. Where Dembski and Ayala diverge, therefore, is on the issue of design. Ayala is open to any non-teleological mechanism in biology, whereas Dembski is open to both teleological and non-teleological mechanisms. To properly assess this disagreement, one needs to consider the metaphysical dimensions of this debate, which is the topic of the next chapter.

CHAPTER 5  
DEMBSKI'S METAPHYSICAL PROJECT

**Introduction**

Developing a method for detecting design is undoubtedly Dembski's most notable contribution to the ID debate. His metaphysical and theological contributions to the debate, however, are more germane for the purposes of this dissertation. This is true primarily because the problem of dysteleology and suboptimal design (hereafter PDSD) is a metaphysical and theological problem. My approach in addressing this problem, therefore, is to utilize Dembski's work on theology and metaphysics to clarify what type of reality is necessary to make the concept of dysteleology intelligible. Particularly, I will defend Dembski's central critique of naturalism and materialism to demonstrate the broader claim that non-teleological worldviews are epistemologically self-defeating.<sup>1</sup> I agree with Dembski that neither naturalism nor materialism can provide an adequate basis for grounding knowledge. Dembski explains,

For naturalism, epistemology's primary problem is unraveling Einstein's dictum: "The most incomprehensible thing about the world is that it is comprehensible."

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<sup>1</sup>I am making a distinction between naturalism and materialism in this chap., although I will frequently use the terms interchangeably. Using these terms interchangeably seems appropriate since Dembski's earlier theological work on ID typically presents naturalism as an alternative worldview to theism, while his most recent work on metaphysics presents materialism as an alternative to his information-theoretic account of reality. Dembski provides a footnote on his use of terms at the beginning of chapter 3 in *Being as Communion*. He writes, "What I'm calling 'materialism' is usually critiqued under the heading of 'naturalism.' Strictly speaking, naturalism is a doctrine asserting nature's completeness and immunity to any action outside nature (such action would be supernatural). As such, naturalism doesn't stipulate the precise form of nature. But in practice, naturalism tends to devolve into materialism because matter certainly seems an integral part of nature and nothing else seems particularly viable for a hard-nosed understanding of nature. Indeed, what else can there be to nature except matter? Energy, for instance, if not material, promises to become some sort of teleological vital force, which is inconsistent with the sobriety and rigor expected of naturalism. Naturalism is, after all, supposed to keep the world safe from the superstitions of supernaturalism." William A. Dembski, *Being as Communion: A Metaphysics of Information* (Burlington, VT: Ashgate, 2014), 17.

How is it that we can have any knowledge at all? Within naturalism there is no solution to this riddle.<sup>2</sup>

Without the solution to this riddle, however, naturalism cannot justify Ayala's scientific and theological critiques against ID. This suggests that Ayala's critiques must, ironically, presuppose a teleological worldview similar to Dembski's in order to become logically coherent.

### **Dembski's Early Critiques of Naturalism**

An examination of Dembski's metaphysical and theological work shows that his fundamental critiques of naturalism and materialism have remained consistent throughout his scholarly career. Both naturalism and materialism, Dembski argues, assume a non-teleological worldview, implying that any purported examples of teleology—watches, cars, computers, etc.—must ultimately be reduced to non-teleological physical processes. While this implication may seem counterintuitive, one should remember that human artifacts are the products of human brains, and naturalism supports the view that human brains are ultimately the products of unguided and mindless evolutionary developments.<sup>3</sup> Removing teleology from reality, naturalists and materialists are forced to answer a presumably insolvable question regarding the nature of human thinking, namely, what justification does anyone have to suppose that human reasoning is trustworthy? If this question cannot be answered, it suggests that naturalism and materialism are self-defeating worldviews.

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<sup>2</sup>William A. Dembski, *Intelligent Design: The Bridge between Science & Theology* (Downers Grove, IL: InterVarsity, 1999), 231-232.

<sup>3</sup>Dembski argues, "Naturalism makes intelligence not a basic creative force within nature but an evolutionary byproduct. In particular, humans (the natural objects best known to exhibit intelligence) are not the crown of creation, not the carefully designed outcome of a purposeful creator and certainly not creatures made in the image of a benevolent God. Rather, humans are an accident of natural history." William A. Dembski, *The Design Revolution: Answering the Toughest Questions about Intelligent Design* (Downers Grove, IL: InterVarsity, 2004), 22.

The details for this argument stem from the notion that all arguments—philosophical, scientific, religious, or otherwise—are constructed by intelligent minds. That is to say, intelligent minds *design* arguments for the purpose of defending certain conclusions. Arguments, then, are a particular type of human artifact. To argue that naturalism and materialism are true is to argue that arguments, like other human artifacts, are ultimately the products of unguided and mindless evolutionary developments. But, if this argument is the case, then how can one say that intelligent minds *design* arguments for the purpose of defending certain conclusions? Given naturalism and materialism, the concepts of “intelligent minds” and “design” are hard, if not impossible, to defend. Without these concepts, however, one cannot defend certain conclusions, such as the conclusions of naturalism or materialism. In other words, carefully constructed arguments cannot exist without design, and naturalism and materialism deny the existence of design. Thus, one cannot construct an argument for naturalism or materialism. Naturalism and materialism both lead to an absurd outlook on life.<sup>4</sup>

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<sup>4</sup>This kind of argument is not unique to Dembski, and has become a fairly common argument among philosophers and Christian apologists over the past several decades. Regarding moral values, C.S. Lewis presents his version of the argument, “In a world of Naturalists [...] all moral judgments would be statements about the speaker’s feelings, mistaken by him for statements about something else (the real moral quality of actions) which does not exist. Such a doctrine, I have admitted, is not flatly self-contradictory.” C. S. Lewis, *Miracles* (New York: HarperCollins, 2001), 57. Alvin Plantinga develops the argument as an evolutionary argument against naturalism (EAAN). He writes, “if *naturalism* is true, there is no God, and hence no God (or anyone else) overseeing our development and orchestrating the course of our evolution. And this leads directly to the question whether it is at all likely that our cognitive faculties, given naturalism and given their evolutionary origin, would have developed in such a way as to be reliable, to furnish us with mostly true beliefs.” Alvin Plantinga, “The Evolutionary Argument against Naturalism: An Initial Statement of the Argument,” in *Naturalism Defeated? Essays on Plantinga’s Evolutionary Argument against Naturalism*, ed. James Beilby (Ithaca, NY: Cornell University Press, 2002), 3. Plantinga’s argument is expressed in Charles Darwin’s famous doubt, “With me the horrid doubt always arises whether the convictions of man’s mind, which has been developed from the mind of lower animals, are of any value or at all trustworthy. Would anyone trust in the convictions of a monkey’s mind, if there are any convictions in such a mind?” Charles Darwin, “Letter to William Graham, Down, July 3, 1881,” in vol. 1 of *The Life and Letters of Charles Darwin Including an Autobiographical Chapter*, ed. Francis Darwin (New York: D. Appleton and Company, 1897), 285. Or consider Patricia Churchland’s often cited passage, “Boiled down to essentials, a nervous system enables the organism to succeed in the four F’s: feeding, fleeing, fighting and reproducing. The principle chore of nervous systems is to get the body parts where they should be in order that the organism may survive.... Improvements in sensorimotor control confer an evolutionary advantage: a fancier style of representing is advantageous *so long as it is geared to the organism’s way of life and enhances the organism’s chances of survival*. Truth, whatever that is,

The aforementioned argument is a crude, but pointed, introduction to Dembski's fundamental critique against naturalism and materialism. If his critique is correct, then Ayala's arguments against ID cannot be grounded in naturalism or materialism. Of course, Ayala will likely find this point irrelevant since he rejects materialism and naturalism.<sup>5</sup> He does not, however, provide a clear theistic alternative.<sup>6</sup> He further rejects a teleological account of reality, which arguably makes his nebulous description of theism susceptible to the same epistemological problems facing naturalism and materialism.

To fully appreciate the epistemological problems stated above, it is useful to examine how the core of Dembski's argument against naturalism and materialism has developed over time. In Dembski's early work on ID, he frequently constructed philosophical, theological, and methodological arguments against naturalism, denouncing it as one of the greatest idols in our culture. He explains,

Those who are blind to God's action in the world have one overriding satisfaction: That this world belongs to them and to them alone. Call those who are blind to God's action in the world "naturalists," and call the view that nature is self-contained "naturalism." For the naturalist God plays no role in the world. Religious believers are apt to think that a world without God is a terribly sad place in which no one given the choice would want to live. But to the naturalist it is precisely the presence of God in the world that threatens to undo it.<sup>7</sup>

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definitely takes the hindmost." Patricia Churchland, "Epistemology in the Age of Neuroscience," *Journal of Philosophy* 84 (1987): 548. Thomas Nagel agrees with Plantinga, arguing that, "Evolutionary naturalism implies that we shouldn't take any of our convictions seriously, including the scientific world picture on which evolutionary naturalism itself depends." Thomas Nagel, *Mind & Cosmos: Why the Materialist Neo-Darwinian Conception of Nature is Almost Certainly False* (New York: Oxford University Press, 2012), 28. In the body of this chap., I also refer to other thinkers who articulate similar arguments pertaining to the problem against naturalism.

<sup>5</sup>As mentioned in chap. 2, Ayala rejects metaphysical naturalism but embraces methodological naturalism, claiming that, "a scientific view of the world is hopelessly incomplete. Matters of value and meaning are outside science's scope." Francisco J. Ayala, *Darwin and Intelligent Design* (Minneapolis: Fortress, 2006), 102.

<sup>6</sup> Furthermore, his fundamental solution to PDS is to reduce the modes of causation in nature to merely chance and necessity. See chap. 3.

<sup>7</sup>Dembski, *Intelligent Design*, 99.

This paragraph highlights an appropriate religious motivation within Dembski's project. He frequently acknowledges that ID is larger than a scientific debate, and his colleague Phillip Johnson, arguably the movement's most influential popularizer, likewise emphasizes the religious and philosophical nature of the debate. Johnson argues in several of his works that naturalism has replaced Christian theism as the dominant religious voice in the culture. In *Reason in the Balance*, he describes the religion of naturalism as:

*A metaphysical doctrine, which means simply that it states a particular view of what is ultimately real and unreal. According to naturalism, what is ultimately real is nature, which consists of the fundamental particles that make up what we call matter and energy, together with the natural laws that govern how those particles behave. Nature itself is ultimately all there is, at least as far as we are concerned. To put it another way, nature is a permanently closed system of material causes and effects that can never be influenced by anything outside of itself – by God, for example. To speak of something as “supernatural” is therefore to imply that it is imaginary, and belief in powerful imaginary entities is known as superstition.<sup>8</sup>*

This religion, according to Johnson, cannot grant the existence of supernatural entities because, in principle, supernatural entities are antithetical to naturalism. Johnson further contends that naturalism implies that any supposed teleological entity must be deemed supernatural, since all particles of reality are governed by *natural laws*. Naturalism cannot support the ID project, therefore, given that naturalism is a non-teleological worldview. To engage in the ID project, consequently, one must build a case against naturalism.

Thus, Dembski's work frequently engages metaphysical and theological questions. As mentioned in chapter 1, this engagement has often confused critics of ID, especially concerning his unapologetic participation in the creation-evolution controversy. One can certainly understand why critics have pointed to such participation as evidence for the claim that ID is merely repackaged creationism, however, this claim is

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<sup>8</sup>Phillip E. Johnson, *Reason in the Balance: The Case Against Naturalism in Science, Law & Education* (Downers Grove, IL: InterVarsity Press, 1995), 37-38.

misleading.<sup>9</sup> Dembski's contribution to the debate over creation and evolution has primarily focused on worldview questions related to that debate. Dembski explains,

We are dealing here with something more than a straightforward determination of scientific facts or confirmation of scientific theories. Rather we are dealing with competing worldviews and incompatible metaphysical systems. In the creation-evolution controversy we are dealing with a naturalistic metaphysic that shapes and controls what theories of biological origins are permitted on the playing field in advance of any discussion or weighing of evidence. This metaphysic is so pervasive and powerful that it not only rules alternative views out of court, but it cannot even permit itself to be criticized.<sup>10</sup>

Dembski's point is that ID faces obstacles, not because of the physical evidence, but because the "scientific outlook" on nature undermines the teleological notions of creation. The prevailing scientific wisdom, in other words, is that the world of *nature* is not *creation*. Nature, furthermore, is self-contained and self-driven. Again, Dembski writes,

Turn on the television to watch a nature program and you will be regaled with all the wonderful things nature does. Nature is responsible for the giraffe's neck, the eagle's talons and the angler fish's lure. Nature gives us rain forests, roses and rutabagas. Nature feeds, clothes and entertains us. Nature spans everything from quarks to galaxy clusters. Most significant, we are part of nature. With nature fulfilling so many vital roles, it's fair to ask, What is nature? Definitions abound. Nature is the material or physical world. Nature is the biophysical universe. Nature is the natural order. Nature is the realm of space, time and energy. Nature is that part of reality described by natural laws. Nature is what scientists study—the domain of science.<sup>11</sup>

He continues,

Each of these definitions is right as far as it goes. Implicit in these definitions, however, is a telling omission. In no instance do we find nature identified with

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<sup>9</sup>This thesis is highlighted in edited volumes such as, *Scientists Confront Intelligent Design and Creationism*, ed. Andrew Petto and Laurie Godfrey (New York: Norton & Company, 2007); *Intelligent Design Creationism and Its Critics: Philosophical, Theological, and Scientific Perspectives* ed., Robert T. Pennock (Cambridge, MA: MIT Press, 2001); and *The Panda's Black Box*, ed. Nathaniel C. Comfort (Baltimore: The Johns Hopkins University Press, 2007).

<sup>10</sup>Dembski, *The Bridge*, 115.

<sup>11</sup>*Ibid.*, 97.

creation. To be sure, in common parlance we often merge the two, referring to nature and creation interchangeably. But creation is always a divine act, whereas nature is a self-contained entity independent of God. God is irrelevant to nature. Nature treats the world as though it were self-sufficient and not in need of a creator. Creation requires a creator, but nature requires no creator. A creator might exist, but one need not exist for the world to be nature. Nature is what the world would be if there were no God.<sup>12</sup>

These two paragraphs highlight, according to Dembski, the metaphysical and theological significance of the debate over ID. Specifically, Dembski elucidates the distinction between *nature* and *creation*, asserting that *creation* is a more appropriate term than *nature* when it comes to describing the observable world. If Dembski's assertion is correct, then God's interaction with the world might be empirically detectable.<sup>13</sup> If the observable world is described as *nature*, however, then God either does not exist or is "marvelously adept at covering his tracks and giving no evidence that he ever interacted with the world."<sup>14</sup> This creation/nature distinction is vital for understanding Dembski's early theological work on ID. What is God like? How does God create? Dembski argues that a theist who describes the observable world naturalistically is, practically speaking, no different than an atheist.<sup>15</sup>

After clarifying the distinction between nature and creation, Dembski constructs arguments against naturalism and for a Christian doctrine of creation. This does not mean he argues for a specific doctrine of creation. Rather, he argues for creation more generally, claiming that naturalism and Christianity "provide radically different

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<sup>12</sup>Dembski, *The Bridge*, 97-98.

<sup>13</sup>Ibid., 104.

<sup>14</sup>Ibid. This is apparently the position of Ayala. God exists, but has chosen not to make his existence evident in the natural world.

<sup>15</sup>Ibid., 110. Again, Ayala seems to fit this description. This does not mean, of course, that Ayala should be regarded as an atheist. One can certainly argue that metaphysical precision and accuracy is not a prerequisite for an authentic faith. Dembski's point is that a non-teleological conception of theism seems virtually indistinguishable from naturalism – a point that is relevant for the epistemological considerations addressed in this dissertation.

perspectives on the act of creation.”<sup>16</sup> Naturalism is a *matter-first* worldview, whereas theism is a *mind-first* worldview. Dembski explains,

The naturalist’s world is not a mind-first world. Intelligent agency is neither *sui generis* nor basic.... It is important to distinguish the naturalist’s understanding of causation from the theist’s. Within theism God is the ultimate reality. Consequently whenever God acts, there can be nothing outside of God that compels God’s action. God is not a billiard ball that must move when another billiard ball strikes it. God’s actions are free, and though he responds to his creation, he does not do so out of necessity. Within theism, therefore, divine action is not reducible to some more basic mode of causation.... Now consider naturalism. Within naturalism nature is the ultimate reality. Consequently whenever something happens in nature, there can be nothing outside of nature that shares responsibility for what happened.<sup>17</sup>

The two worldviews highlighted in the paragraph above promote two competing notions of causation within the observable world. Theism argues that God is the ultimate reality; naturalism argues that nature is the ultimate reality. Naturalism contends that nature governs all events according to necessity or chance, whereas theism contends that God governs all events according to God’s free actions and choices. These two worldviews are thus fundamentally in conflict with one another.

Dembski further notes that the distinction between a matter-first and mind-first worldview is significant when one explains the mystery of human agency. How can a matter-first worldview give rise to intelligent human agency? Dembski argues that this question cannot be answered:

[For the naturalist], intelligent agency is . . . in no sense prior to or independent of nature. Intelligent agency is neither *sui generis* nor basic. Intelligent agency is a derivative mode of causation that depends on underlying naturalistic—and therefore unintelligent—causes. Human agency in particular supervenes on underlying natural processes, which in turn are usually identified with brain function.<sup>18</sup>

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<sup>16</sup>Dembski, *The Bridge*, 212.

<sup>17</sup>*Ibid.*, 214.

<sup>18</sup>*Ibid.*

In other words, the reason the question cannot be answered is because intelligent human agency presumably cannot be reduced to underlying natural processes. In recent years, the depth of this problem has only seemed to increase. David Chalmers, for example, explains this mystery of agency by proposing what he calls the hard problem of consciousness.<sup>19</sup> Roughly stated, the hard problem of consciousness seeks to understand how mass, time, and space give rise to a first-person conscious experience. Chalmers maintains that there are no current plausible answers to this question, and therefore one must be willing to embrace counterintuitive ideas. The counterintuitive idea put forth by Chalmers is known as panpsychism, the idea that consciousness is just as fundamental as mass, time, and space.<sup>20</sup> While Chalmers admits that his view is strange, he maintains that it is just as plausible as the alternative counterintuitive idea, namely, that consciousness is an illusion.<sup>21</sup>

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<sup>19</sup>When discussing the hard problem of consciousness, Chalmers distinguishes it from the “easy” problems. The easy problems, according to Chalmers, are problems that can be solved using the standard methods of cognitive science. The hard problem of consciousness, by contrast, is the problem of experience. Chalmers writes, “When we think and perceive, there is a whirl of information processing, but there is also a subjective aspect. As Nagel (1974) has put it, there is *something it is like* to be a conscious organism. This subjective aspect is experience. When we see, for example, we *experience* visual sensations: the felt quality of redness, the experience of dark and light, the quality of depth in a visual field.... It is undeniable that some organisms are subjects of experience, but the question of why it is that these systems are subjects of experience is perplexing. Why is it that when our cognitive systems engage in visual and auditory information processing, we have visual or auditory experience: the quality of deep blue, the sensation of middle C? How can we explain why there is something it is like to entertain a mental image or to experience an emotion? It is widely agreed that experience arises from a physical basis, but we have no good explanation of why and how it so arises. Why should a physical processing give rise to a rich inner life at all? It seems objectively unreasonable that it should, and yet it does.” David J. Chalmers, *The Character of Consciousness* (New York: Oxford University Press, 2010), 5.

<sup>20</sup>Chalmers explains, “the view can be seen as a sort of neutral monism: there are underlying neutral properties X (the protophenomenal properties), such that the X properties are simultaneously responsible for constituting the physical domain (by their relations) and the phenomenal domain (by their collective intrinsic nature). In its phenomenal form, the view can be seen as a sort of idealism, such that mental properties constitute physical properties, although these need not be mental properties in the mind of an observer, and they may need to be supplemented by causal and spatiotemporal properties in addition. One could also characterize this form of view as a sort of panpsychism, with phenomenal properties ubiquitous at the fundamental level” (ibid., 134).

<sup>21</sup>Daniel Dennett defends this second counterintuitive idea. He argues, “While there are still thinkers who gamely hold out for consciousness being some one genuine precious thing (like love, like

Chalmers and the aforementioned hard problem of consciousness will be explored more fully in chapter 6. I briefly mention this problem here to highlight that Dembski rightly recognizes the difficulty naturalism has in accounting for human agency and consciousness. Chalmers embraces the difficulty and argues that consciousness must be a fundamental aspect of reality. Dembski argues, instead, that consciousness is the fundamental aspect of reality, and consequently mass, time, and space are derivative of the fundamental consciousness.

Given a matter-first worldview, Dembski further argues that human agency is not explicable. This is problematic when one considers that human agency produces every thought, argument, judgment, and emotion experienced by a human subject. If naturalism implies there is no plausible explanation of human agency, however, then one cannot ground any argument that leads one to conclude that naturalism is plausible. Naturalism, as mentioned in the introduction of this chapter, faces the epistemological problem of being self-referentially incoherent. Presumably, people are naturalists because there are compelling arguments for naturalism, but naturalism leads to the conclusion that no argument is valid or sound, including arguments for naturalism. Hence, there are no valid or sound arguments for naturalism.

Numerous philosophers and intellectuals have articulated the self-defeating nature of naturalism more winsomely and systematically than stated above. C.S. Lewis, for example, succinctly and elegantly captures the argument in the following paragraphs:

All possible knowledge . . . depends on the validity of reasoning. If the feeling of certainty which we express by words like *must be* and *therefore* and *since* is a real perception of how things outside our own minds really “must” be, well and good. But if this certainty is merely a feeling *in* our own minds and not a genuine insight into realities beyond them—if it merely represents the way our minds happen to

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gold), a thing that is just ‘obvious’ and very, very special, the suspicion is growing that this is an illusion.” Daniel C. Dennett, *Consciousness Explained* (Boston: Little Brown, 1991), 23.

work—then we can have no knowledge. Unless human reasoning is valid no science can be true.<sup>22</sup>

He continues,

It follows that no account of the universe can be true unless that account leaves it possible for our thinking to be a real insight. A theory which explained everything else in the whole universe but which made it impossible to believe that our thinking was valid, would be utterly out of court. For that theory would itself have been reached by thinking, and if thinking is not valid that theory would, of course, be itself demolished. It would have destroyed its own credentials. It would be an argument which proved that no argument was—a proof that there are no such things as proofs—which is nonsense.<sup>23</sup>

By describing naturalism as a theory that explains “everything else in the whole universe but which made it impossible to believe that our thinking was valid,” Lewis cleverly highlights the logical incoherence of naturalism.

Alvin Plantinga, likewise, has published extensively on what he calls the evolutionary argument against naturalism (EAAN).<sup>24</sup> He explains,

The basic idea of my argument could be put (a bit crudely) as follows. First, the probability of our cognitive faculties being reliable, given naturalism and evolution, is low. (To put it a bit inaccurately but suggestively, if naturalism and evolution were both true, our cognitive faculties would very likely not be reliable.) But then according to the second premise of my argument, if I believe both naturalism and evolution, I have a *defeater* for my intuitive assumption that my cognitive faculties

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<sup>22</sup>Lewis, *Miracles*, 21.

<sup>23</sup>*Ibid.*, 21-22.

<sup>24</sup>His most recent book articulating EAAN is, Alvin Plantinga, *Where the Conflict Really Lies: Science, Religion, and Naturalism* (New York: Oxford University Press, 2011). Plantinga's warrant series further provides an exhaustive treatment of various epistemological problems with non-teleological approaches to knowledge, and concludes by contending that a belief B, “has warrant for you if and only if (1) the cognitive faculties involved in the production of B are functioning properly...; (2) your cognitive environment is sufficiently similar to the one for which your cognitive faculties are designed; (3) the triple of the design plan governing the production of the belief in question involves, as purpose or function, the production of true beliefs (and the same goes for elements of the design plan governing the production of input beliefs to the system in question); and (4) the design plan is a good one: that is, there is a high statistical or objective probability that a belief produced in accordance with the relevant segment of the design plan in that sort of environment is true. Under these conditions, furthermore, the degree of warrant is given by some monotonically increasing function of the strength of S's belief that B. This account of warrant, therefore, depends essentially upon the notion of proper function.” Alvin Plantinga, *Warrant and Proper Function* (New York: Oxford University Press, 1993), 194. See also Alvin Plantinga, *Warrant: The Current* (New York: Oxford University Press, 1993); and Alvin Plantinga, *Warranted Christian Belief* (New York: Oxford University Press, 2000).

are reliable. If I have a defeater for *that* belief, however, then I have a defeater for *any* belief I take to be produced by my cognitive faculties. That means that I have a defeater for my belief that naturalism and evolution are true. So my belief that naturalism and evolution are true gives me a defeater for that very belief; that belief shoots itself in the foot and is self-referentially incoherent; therefore I cannot rationally accept it. And if one can't accept both naturalism and evolution, that pillar of current science, then there is serious conflict between naturalism and science.<sup>25</sup>

Plantinga's EAAN has certainly sparked controversy over the past few decades, but the argument continues to influence both theistic and non-theistic philosophers.<sup>26</sup> Thomas Nagel, for example, agrees with the central premise of Plantinga's argument, affirming that, "the application of evolutionary theory to the understanding of our own cognitive capacities should undermine, though it need not completely destroy, our confidence in them."<sup>27</sup> Nagel argues this because the mechanisms of belief formation, given naturalism, are not aimed at constructing true theoretical accounts of the world.<sup>28</sup> Thus, we have no reason to trust any of our beliefs.

In addition to EAAN, other related criticisms of naturalism continue to develop. Victor Reppert constructs the following argument:<sup>29</sup>

1. Either at least some of the fundamental causes of the universe are more like a mind than anything else, or they are not.
2. If they are not, then it is either impossible or extremely improbable that reason should emerge.

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<sup>25</sup>Plantinga, *Where the Conflict Really Lies*, 314. Plantinga abbreviates this argument as: "P(R/N&E) is low. 'R' is the proposition that our cognitive faculties are reliable, 'N' is naturalism, and 'E' is the proposition that we and our cognitive faculties have come to be in the way proposed by the contemporary scientific theory of evolution. 'P(.../\_\_\_)' is shorthand for 'the probability of... given \_\_\_'" (ibid., 317).

<sup>26</sup>For an introduction to the common objections raised against EAAN, see James Beilby, ed., *Naturalism Defeated? Essays on Plantinga's Evolutionary Argument against Naturalism* (Ithaca, NY: Cornell University Press, 2002).

<sup>27</sup>Nagel, *Mind & Cosmos*, 27.

<sup>28</sup>Ibid.

<sup>29</sup>Victor Reppert, "The Argument from Reason," in *The Blackwell Companion to Natural Theology*, ed. William L. Craig and J. P. Moreland (Malden, MA: Blackwell, 2012), 347.

3. All things being equal, worldviews that render it impossible or extremely improbable that reason should emerge should be rejected in favor of worldviews according to which it is not impossible and not improbable that reason should emerge.
4. Therefore, we have good reason to reject all worldviews that reject the claim that the fundamental causes of the universe are more like a mind than anything else.

Reppert has naturalism and materialism in mind when he describes any worldview that rejects “the claim that the fundamental causes of the universe are more like a mind than anything else.” William Hasker, similarly, critiques physicalism as follows:

Given the physicalist assumption, *the occurrence and content of conscious mental states such as belief and desire are irrelevant to behavior and are not subject to selection pressures*. On this assumption, *natural selection gives us no reason to assume that the experiential content of mental states corresponds in any way whatever to objective reality*. And since on the physicalist scenario Darwinist epistemology is the *only* available explanation for the reliability of our epistemic faculties, the conclusion to be drawn is that physicalism not only not only *has not given* any explanation for such reliability, but it *is in principle unable to give* any such explanation. And that, it seems to me, is about as devastating an objection to physicalism as anyone could hope to find.<sup>30</sup>

Hasker’s objection to physicalism provides a more aggressive form of the argument against naturalism. Whereas Plantinga, Nagel, and Reppert leave room for the unlikely chance that naturalism might produce reliable epistemic faculties, Hasker contends that such a scenario cannot happen *in principle*. On Hasker’s account of the argument, naturalism is hopelessly self-defeating.

Dembski thus has support when it comes to his general argument against naturalism. His particular emphasis on the ID project, however, nuances his argument as a critique of Darwinism. According to Dembski, Darwinism is a worldview consisting of three distinct aspects. First, Darwinism consists of *physical content*, which refers to the notion of common descent within biology. Second, Darwinism includes *theoretical content*, which refers to the mutation-selection mechanism as the sole driving force of the

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<sup>30</sup>William Hasker, *The Emergent Self* (Ithaca, NY: Cornell University Press, 2001), 79. While Hasker uses the word “physicalism” rather than “naturalism”, there is practically no difference in the meaning of these two terms.

evolutionary process. Last, Darwinism has *regulative principles* that signify *methodological naturalism* (MN).<sup>31</sup>

By articulating Darwinism as an overarching worldview with these three aspects, Dembski brings clarity to his understanding of the debate over ID. Intelligent Design, for Dembski, does not necessarily deny the physical content of Darwinism, but it does reject Darwinism's theoretical content and its regulative principles.<sup>32</sup> Clarifying this issue suggests that the Darwinism/ID debate is primarily a philosophical debate, rather than scientific debate. When it comes to Darwinism's theoretical content, there is no scientific argument that demonstrates that chance mutations and natural selection are the only driving forces of evolution. Furthermore, no empirical way exists to determine that non-teleological mechanisms are the only viable alternatives to Darwinism's theoretical content. As for MN, the regulative principles of Darwinism, this debate is purely philosophical in nature.

The aforementioned clarification of Darwinism as a worldview helps distinguish the specific differences between Dembski's ID and Ayala's theistic evolution. The chief differences between Dembski and Ayala lie in their different perspectives concerning the theoretical content and regulative principles of Darwinism. Dembski explains,

Theistic evolutionists [like Ayala] think Darwin got nature right and then adapt their theology to suit Darwinian science. Proponents of intelligent design, by contrast, ask the logically prior question whether Darwin did in fact get nature right. Indeed,

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<sup>31</sup>For a full discussion on these ideas, see William A. Dembski, "The Task of Apologetics," in *Unapologetic Apologetics: Meeting the Challenges of Theological Studies*, ed. William Dembski and Jay Wesley Richards (Downers Grove, IL: InterVarsity, 2001), 36.

<sup>32</sup>In chap. 2, Ayala makes distinctions between the fact of evolution, the history of evolution, and the mechanism of evolution. As argued earlier, ID is consistent with the fact and history of evolution, even though many ID advocates critique both.

why should we think that natural forces, apart from intelligent guidance, have the power to create biological information?<sup>33</sup>

Note that Dembski is not debating Darwin's scientific observations, but rather the naturalistic implications that theistic evolutionists draw from Darwin's observations. Such naturalistic implications are apparent in Ayala's work, most clearly regarding his central claim that Darwin's great accomplishment was to demonstrate how life could arise without teleology. If Ayala is correct in this claim, then Darwin's accomplishment is a philosophical, rather than scientific, accomplishment.

Recognizing the philosophical nature of Darwin's alleged accomplishment, therefore, helps one articulate the worldview implications of Darwin. Ayala's claim is that Darwin demonstrates a non-teleological outlook on nature; therefore, a Darwinian worldview is non-teleological. What, then, makes this worldview different than naturalism? Darwin's great accomplishment, to use Ayala's words, is practically indistinguishable from confirming naturalism. Dembski understands why an atheist would adopt a Darwinian worldview, but he does not understand why a professed theist would adopt Darwinism. For Dembski, theistic evolutionists join hands with atheists in "proclaiming that purposeful design in biology is *scientifically undetectable*."<sup>34</sup> Ayala takes this one step further by arguing that teleology is not only undetectable, but absent from nature.

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<sup>33</sup>William A. Dembski and Robert Marks II, "Life's Conservation Law: Why Darwinian Evolution Cannot Create Biological Information," in *The Nature of Nature: Examining the Role of Naturalism in Science*, ed. Bruce Gordon and William A. Dembski (Wilmington, DE: Intercollegiate Studies Institute, 2011), 365. Dembski further explains, "Because God is intimately involved with the world moment by moment, there is no question that God interacts with the world. This is a tenet of our faith that brooks no controversy. Controversy arises, however, once we ask whether God's interaction with the world is *empirically detectable*. It is one thing as a matter of faith to hold that God exists, interacts with and sovereignly rules the world. Alternatively, it may be argued on philosophical grounds that the world and its laws are not self-explanatory and therefore point to a transcendent source. But it is another matter entirely to assert that the empirical evidence supports God's interaction with the world, rendering God's interaction empirically detectable." William A. Dembski, "What Every Theologian Should Know about Creation, Evolution & Design," in *Unapologetic Apologetics: Meeting the Challenges of Theological Studies*, ed. William Dembski and Jay Wesley Richards (Downers Grove, IL: InterVarsity, 2001), 222.

<sup>34</sup>Dembski, "Life's Conservation Law," 365.

Ayala's response to the charge that he is a naturalist is to nuance his position by claiming that he promotes MN when it comes to science. He explicitly rejects metaphysical naturalism and argues that his practical naturalism only applies within the domain of science. Outside of that domain, one can freely talk about purpose, morality, and even spiritual realities. From Ayala's perspective, many controversies in the religion and science dialogue would be avoided if theologians and scientists would properly distinguish science from other lines of intellectual inquiry. This simple distinction, however, is presumably overlooked by both religious and non-religious participants of the science versus religion debate. Ayala explains,

The well-known evolutionist Richard Dawkins explicitly denies design, purpose, and values: "the universe that we observe has precisely the properties we should expect if there is, at bottom, no design, no purpose, no evil and no good, nothing but blind, pitiless indifference." It is ironic that [authors like Dawkins] are, in fact, endorsing the beliefs of ID proponents who argue that science is inherently materialist and share the ID conceit that science makes assertions about values, meaning, and purpose.<sup>35</sup>

Ayala's contention in this paragraph is that science is not a discipline that provides knowledge about every area of life. Science only studies the natural world, which means that one should not make scientific assertions regarding values, meaning, and purpose. Such assertions misunderstand the nature of science. Methodological Naturalism, therefore, is Ayala's regulatory principle for scientific knowledge, but not for all knowledge.<sup>36</sup> He further comments,

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<sup>35</sup>Ayala, *Darwin and Intelligent Design*, 101-2.

<sup>36</sup>Ayala also mentions three traits that distinguish science from all other forms of knowledge. First, science is different than common sense because science is concerned with formulating general laws and theories that manifest patterns of relations between very different kinds of phenomena. Second, science seeks to formulate explanations for natural phenomena by identifying the conditions that account for their occurrence. At this point, science is within the same classification as mathematics, philosophy, and theology. The third distinction is what makes it different, namely, empirical falsification. Falsification is the proper demarcation that sets science apart from other forms of knowledge, an idea that Karl Popper calls the criterion of demarcation. He also mentions four other ideas: (1) science must be internally consistent, (2) science must have explanatory value, (3) a scientific finding must be consistent with preexisting scientific knowledge, and (4) a scientific idea must be tested empirically. See Francisco J. Ayala, "From Paley to Darwin: Design to Natural Selection," in *Back to Darwin: A Richer Account of*

A scientific view of the world is hopelessly incomplete. There are matters of value and meaning that are outside science's scope. Even when we have a satisfying scientific understanding of a natural object or process, we are still missing matters that may well be thought by many to be of equal or greater import.<sup>37</sup>

This paragraph rightly highlights the limitations of science, and Ayala is certainly correct to propose that a complete worldview must leave room for ethics, aesthetics, mathematics, and religious approaches to knowledge. What separates Dembski from Ayala on this issue is the relationship between science and other domains of inquiry, including religious inquiry. Ayala seems to think that the various domains of knowledge have little or no relationship with each other, whereas Dembski sees more continuity between the disciplines.

To understand why continuity between different domains of knowledge is important to Dembski, one might consider one of his early critiques of MN. Specifically, Dembski forces advocates to ask why they would embrace MN as a guiding principle in science if they do not affirm metaphysical naturalism. On the surface, a tension seems to exist when affirming one but not the other. In *The Design Revolution*, Dembski elucidates this tension by grouping naturalism into four categories or what he calls antiteleological naturalism (ATN), methodological naturalism (MN), antisupernaturalistic naturalism (ASN), and pragmatic naturalism (PN). Dembski defines ATN as philosophical or metaphysical naturalism, where nature is self-contained and operates solely according to blind physical processes.<sup>38</sup> He explains,

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*Evolution*, ed. John Cobb Jr. (Grand Rapids: Eerdmans, 2008), 56-57. For Popper on the criterion of demarcation, see Karl Popper, *The Two Fundamental Problems of the Theory of Knowledge*, ed. Troels E. Hansen (New York: Routledge, 2009), 10-11.

<sup>37</sup>Ayala, "From Paley to Darwin," 57-58.

<sup>38</sup>In this distinction, Dembski also includes epistemological naturalism, reductive naturalism, scientific naturalism, scientific materialism, materialism, and physicalism. See William A. Dembski, *The Design Revolution: Answering the Toughest Questions about Intelligent Design* (Downers Grove, IL: InterVarsity, 2004), 169, 171-72.

Antiteleological naturalism is the predominant form of naturalism – it’s what’s usually meant by the term *naturalism*. Antiteleological naturalism takes nature to be all there is and views nature, at the nuts-and-bolts level, as operating purely by blind natural causes. These are causes characterized by chance and necessity and ruled by unbroken natural laws.<sup>39</sup>

This version of naturalism, for Dembski, implies that there is no objective meaning, purpose, or values in the real world. Such an implication is a metaphysical implication, but it certainly spills over into other domains of knowledge. An ethicist, for example, cannot consistently embrace ATN when it comes to metaphysics and also argue that John Rawls’s egalitarian approach to social justice is correct from the standpoint of ethics.<sup>40</sup> This is because ATN presumably leads to the conclusion that ethics is a meaningless discipline given that there is no objective meaning, purpose, or values in the real world. At best, ethics is a psychological and social analysis of how people and cultures react and feel when certain events occur in history. To argue otherwise, from the perspective of an ATN advocate, is to suspend one’s belief in ATN in order to maintain that ethical values somehow transcend psychology and sociology. This example illustrates the problem with completely separating different domains of knowledge.

Dembski further illustrates this problem in his critique of MN. As mentioned above, Ayala argues that MN represents the scientific way of knowing and not the only way of knowing, thus separating the domains of knowledge into different spheres.

Dembski expands upon Ayala’s description of MN, stating,

Methodological naturalism . . . is willing to grant that there may be more to reality than chance and necessity. Methodological naturalism doesn’t care what you believe deep down. Yet for the sake of science, methodological naturalism insists that scientists pretend as though antiteleological naturalism is true. Nancey Murphy has called this view *methodological atheism*. The idea here is that science is a method for investigating nature and that to understand nature scientists must only invoke “natural processes.” In this context the term “natural processes” means

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<sup>39</sup>Dembski, *The Design Revolution*, 169.

<sup>40</sup>I am not arguing here that an ethicist would never attempt to do such a thing; rather, I am arguing that ethicists who do so are arguing inconsistently.

processes operating entirely according to unbroken natural laws and characterized by chance and necessity.<sup>41</sup>

The principle of MN, therefore, suggests that questions about teleology fall into the spheres of metaphysics or theology. Likewise, questions about justice would fall into the sphere of ethics, and questions of beauty fall into the sphere of aesthetics. Each domain is separate, and keeping them separate preserves the integrity of each sphere. The sphere of science, accordingly, embraces MN to preserve its integrity as a discipline.

Dembski challenges the principle MN, claiming that it rules out the possibility of ID before an honest investigation of the relevant data. Furthermore, he contends that advocates of MN are unwilling to allow other plausible methods into scientific discourse:

If methodological naturalism were merely a working hypothesis, maintained because it supposedly has served science well in the past, that would be one thing. As a working hypothesis, it would be optional, and scientists who found the hypothesis no longer helpful would be free to discard it. But methodological naturalism isn't saying that we have yet to encounter empirical evidence of design in nature but we should stay open to it in case it comes along. Rather, methodological naturalism insists that one is most logical, most scientific, if one pretends such an empirical possibility is logically impossible. Instead of holding methodological naturalism as a working hypothesis, methodological naturalists hold it as a dogma.<sup>42</sup>

Dembski's point is that MN is not based upon evidence; rather, it is a philosophical dogma that unnecessarily restricts science to explain nature non-teleologically. Again, he explains, "The rule that science should refuse teleology seems . . . less a requirement of science as such than a logical consequence of [naturalism]: if [naturalism] is true, then no fundamental or real teleology can exist in nature for science to study; instead, any teleology or intelligence in nature must result from underlying nonteleological processes."<sup>43</sup> Dembski's claim is that MN presupposes ATN, whether knowingly or

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<sup>41</sup>Dembski, *The Design Revolution*, 170.

<sup>42</sup>*Ibid.*, 171.

<sup>43</sup>Dembski, *Being as Communion*, 49-50. Note that this quote does not come from Dembski's early critiques of naturalism, and also note that I replaced the word "materialism" with "naturalism."

unknowingly. Why else would one assume MN as a guiding principle in biology? If one thought it were possible for the world of biology to exhibit design, then one would adopt a method for scientific investigation that makes it possible to detect design in biology. Methodological Naturalism, however, rules out that possibility in principle.

In addition to ATN and MN, Dembski provides further distinctions between ASN and PN. Antisupernaturalist Naturalism maintains that supernatural activities cannot be detected in the natural world, but teleology may be detected. Explaining the nuances between the aforementioned varieties of naturalism, Dembski writes,

Antisupernaturalist naturalism, like Christian theism, leaves nature open to real teleology and so opens the door to intelligent design as a scientific enterprise. In contrast, antiteleological and methodological naturalism completely rule out intelligent design as a scientific project: intelligent design is a nonstarter if one adopts either of these views. Nevertheless, because antisupernaturalist naturalism is so much friendlier to intelligent design, one runs the risk of overlooking just how metaphysically uneasy is the fit between intelligent design and antisupernaturalist naturalism. The problem is that the whole concept of design implies giving something a capacity it did not possess before. As Aristotle put it, the art of ship building is not in the wood; it takes a designer to arrange the wood to make the ship. Design arranges preexisting materials and thereby confers on them something they did not previously possess. But within antisupernaturalist naturalism, there is no bestowing of any gift on nature. Naturalism, whether antisupernaturalist or antiteleological, views nature as the ultimate reality and one that is complete in itself.<sup>44</sup>

The theological differences between ATN and ASN are minor, from Dembski's perspective, but ASN is more open to the language of teleology and intelligence. Antisupernaturalist Naturalism further insists that if God exists, he exists totally independent of the natural world and would never "violate the causal principles that govern reality."<sup>45</sup> Thus miraculous activities are not permitted given ASN.

Pragmatic Naturalism is the only understanding of naturalism that could be consistent with Christianity, according to Dembski. Pragmatic Naturalism states that the

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<sup>44</sup>Dembski, *The Design Revolution*, 176.

<sup>45</sup>*Ibid.*, 172.

goal of science is simply to understand nature. This approach is distinct from MN because it is not concerned with removing teleological explanations from science, so long as such explanations are insightful. Dembski explains,

Pragmatic naturalism wants simply to understand nature and doesn't care what entities are invoked to facilitate that understanding, so long as they prove conceptually fruitful. The philosopher Willard Quine was a pragmatic naturalist (as was Ludwig Wittgenstein). Accordingly, Quine was able to entertain the following possibility: "If I saw indirect explanatory benefit in positing sensibilia, possibilia, spirits, a Creator, I would joyfully accord them scientific status too, on par with such avowedly scientific posits as quarks and black holes." Quine's pragmatic naturalism clearly places no restraint on the intelligent design or, for that matter, on Christian theism.<sup>46</sup>

Thus, Dembski reasons that if PN were the operating principle of scientific investigation, then there would be no philosophical conflict between ID and the scientific community.

### **Dembski's Recent Critique of Materialism**

Similar to Dembski's early critiques of naturalism are his more recent critiques of materialism.<sup>47</sup> In *Being as Communion*, Dembski argues against materialism in favor of an information-theoretic account of reality.<sup>48</sup> Given materialism, Dembski argues that all information and perceived teleology in the world would be reduced to material substances and causes. In other words, materialists regard particles as the fundamental stuff of reality. Dembski notes that this perspective on reality undermines the notions of design, information, and even basic intelligibility:

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<sup>46</sup>Dembski, *The Design Revolution*, 177.

<sup>47</sup>Dembski explains his use of the word *materialism* over *naturalism* in his later works: "What I'm calling 'materialism' is usually critiqued under the heading of 'naturalism.' Strictly speaking, naturalism is a doctrine asserting nature's completeness and immunity to any action outside nature (such action would be supernatural). As such, naturalism doesn't stipulate the precise form of nature. But in practice, naturalism tends to devolve into materialism because matter certainly seems an integral part of nature and nothing else seems particularly viable for a hard-nosed understanding of nature. Indeed, what else can there be to nature except matter?" Dembski, *Being as Communion*, 17.

<sup>48</sup>On Dembski's personal website, he writes that *Being as Communion* is his best work on ID. William A. Dembski, "A New Day," accessed on December 11, 2015, <http://www.billdembski.com>.

Because matter is all that exists within materialism, any design will just be one item of matter causing a change in another item of matter. And since matter at root is nonteleological, any teleology associated with such design is, in the end, merely a byproduct of underlying nonteleological material processes. In this way, materialism destroys any fundamental or real teleology in nature.<sup>49</sup>

In other words, materialism leads to the absurd conclusion that every example of design is actually not designed. This means that books, ships, computers, or any other examples of human design are reduced to non-teleological explanations.<sup>50</sup>

Dembski expresses this conclusion when he rhetorically asks, “If humans are the product of natural selection (conceived nonteleologically), would not ships themselves be an indirect product of natural selection?”<sup>51</sup> Materialism, it seems, forces one to explain every object in terms of blind physical forces. If this claim is correct, then Dembski notes that there is a significant conflict between materialism and general epistemology. He explains, “How can knowing subjects composed only of matter know that they are only composed of matter? Matter, it would seem, has no intrinsic capacity to produce agents that think, much less that can form representations about the world, much less that can know that these representations are true.”<sup>52</sup> The problem Dembski is

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<sup>49</sup>Dembski, *Being as Communion*, 57.

<sup>50</sup>Dembski reiterates this point when he writes, “Humans have designed all sorts of engineering marvels, everything from Cray supercomputers to Gothic cathedrals. But that means, we are to believe . . . that a blind evolutionary process cobbled together human neuroanatomy, which in turn gave rise to human consciousness, which in turn produces artifacts like supercomputers, which in turn are not cobbled together at all but instead carefully designed. Out pop purpose, intelligence, and design from a process that started with no purpose, intelligence, or design. This is magic.” William A. Dembski, “What Intelligent Design is Not,” in *Signs of Intelligence: Understanding Intelligent Design*, ed. William Dembski and James Kushiner (Grand Rapids: Brazos, 2001), 21.

<sup>51</sup>Dembski, *Being as Communion*, 55-56. Ayala writes, “Inanimate objects and processes (other than those created by humans) are not teleological because they are not directed toward specific ends, they do not exist to serve certain purposes.” Francisco J. Ayala, “Chance and Necessity: Adaptation and Novelty in Evolution,” in *Evolving Dialogue*, ed. J. B. Miller (Harrisburg, PA: Trinity, 2001), 240. Contra Ayala, Dembski asks, “Where does design or intelligent causation fit within this dialectic between chance and necessity? It doesn’t. At best design becomes a byproduct of chance and necessity. If, for instance, the Darwinian mechanism of random variation and natural selection accounts for the emergence of human beings, then human intelligence (with all its design capabilities) is merely a complex behavioral capacity that sits atop blind material processes.” Dembski, *The Design Revolution*, 80.

<sup>52</sup>Dembski, *Being as Communion*, 7.

raising here is similar to the epistemological problem he raised against naturalism. A materialist metaphysic leads one to conclude that the mental states of conscious human knowers supervene on material brain states. This means that every conscious thought, every philosophical argument, and every scientific insight can be explained by unconscious synaptic firings in the brain.<sup>53</sup> Dembski continues,

Because materialism gives primacy to matter, it downgrades the role of intelligence in nature, conceiving of nature in purely material terms, thus making intelligence a byproduct of material nature rather than its source and purpose. Materialism sees matter as fundamentally non-intelligent, and it thus needs to constitute intelligence out of matter.<sup>54</sup>

Materialism, like naturalism, makes it difficult to justify the position that our cognitive faculties are generally reliable guides to truth. This makes materialism a self-defeating worldview that fundamentally undermines scientific investigation.

The aforementioned critique of materialism should not lead to the conclusion, however, that unguided natural processes are wholly irrelevant. Dembski's argument against materialism is simply stating that unguided natural processes cannot be fundamental to reality. This does not discount the possibility that surface-level events are often best explained in terms of mindless activity. For example, one can certainly explain the motion of planets, stars, and galaxies in terms of unguided natural forces. Dembski does not dispute the reality of unguided forces. But when it comes to explaining events like the origin of life, consciousness, language, or human intentions, Dembski contends that materialistic explanations are insufficient and often self-referentially incoherent.<sup>55</sup>

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<sup>53</sup>For more information on the philosophical issues related to consciousness, see John R. Searle, *The Mystery of Consciousness* (New York: NYRB, 1997); Chalmers, *The Character of Consciousness*; and Dennett, *Consciousness Explained*; and Nagel, *Mind & Cosmos*.

<sup>54</sup>Dembski, *Being as Communion*, 48. Elsewhere, Dembski writes, "Within a physicalist ontology intelligent agency is ultimately reducible to event-causation, as a practical matter we cannot dispense with the twin categories of conceptual and physical information." William A. Dembski, *No Free Lunch: Why Specified Complexity Cannot Be Purchased without Intelligence* (Lanham, MD: Rowman & Littlefield, 2002), 140.

<sup>55</sup>Dembski, *Being as Communion*, 80.

The self-defeating nature of materialism further leads to an ethical problem. If general knowledge cannot be justified by materialism, then moral knowledge cannot be justified by implication. Without conscious judgments between right and wrong or good and evil, there would be no philosophical justification for ethics. Dembski explains,

On materialist grounds, neither praise nor blame makes any sense. A ball rolls down an inclined plane (deterministically) and smashes a teacup; a coin is flipped and by landing heads (probabilistically) causes a teacup to fall and smash. No one blames the ball or the coin for the smashed cup. Likewise, on materialist principles, it is groundless to blame a person for moral or any other failure, [because] our minds are limited to the material constitution of our brains (minds transcending brains are simply not an option for materialism), and our brains are simply more complicated arrangements of balls going down inclined planes and coins being tossed. Thus we are not in control, we are not free.<sup>56</sup>

This analysis should be problematic for Christians, but also for any moral realist. The “free” choices of human agents, according to materialism, are simply expressions of physiological laws operating within human brains. The moral implication of this view is that impersonal forces of nature determine all sinful acts, as well as righteous acts. If this is the case, however, then it seems to undermine the notions of sin and righteousness. Without such notions, there is no way to establish Ayala’s dysteleological critique against ID because Ayala’s critique presupposes categories of moral truth, namely, that God would be a cruel designer if he were responsible for the various aspects of suboptimal design in the world. To establish his critique, one must establish a view of reality that leaves room for real moral judgments. Naturalism and materialism, however, both seem incapable of establishing such a view of reality.

### **Dembski’s Information Theoretic Proposal**

Dembski’s metaphysical project, on the other hand, provides plausible solutions to the problems raised by naturalism and materialism. Dembski is not content with merely critiquing materialism; he also proposes an alternative information theoretic

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<sup>56</sup>Dembski, *Being as Communion*, 11-12.

account of reality. His counterintuitive idea suggests that information, rather than matter, is the basic stuff of reality. This view maintains that the concept of existence is about *being in communion and exchanging information*.<sup>57</sup> The observable material world is thus reduced to information, rather than information reduced to matter. Dembski argues,

[What] is real according to this information view of reality is the ability of a thing to produce a characteristic set of patterns. In other words, to say that an entity exists, and is therefore real, is to ascribe to it the ability to produce certain types of information to the exclusion of others. In Aristotelian terms, we might say that reality is gauged in terms of *potential* to produce information.<sup>58</sup>

This proposal may seem strange given the prevailing wisdom of materialism, however, the idea that information is primary is not unique to Dembski or the ID movement.

Intelligent Design critic John Haught proposes a similar metaphysic when he writes, “I want to ask whether the universe itself could be thought of theologically as something like an information system through which a ‘message’ of ultimate importance is being communicated.”<sup>59</sup> Paul Davies, likewise, argues for an information-first view of reality, defending “a view in which *information* is regarded as the primary entity from which physical reality is built.”<sup>60</sup> Keith Ward further suggests that information is an ultimate principle for the universe, which is “logically prior to and ontologically different from any actual physical state.”<sup>61</sup> An information-first view of reality, while still a minority position, is increasingly being explored by philosophers, physicists, theologians, and mathematicians.

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<sup>57</sup>Dembski, *Being as Communion*, xiii.

<sup>58</sup>*Ibid.*, 86.

<sup>59</sup>John F. Haught, “Information, Theology, and the Universe,” in *Information and the Nature of Reality*, ed. Paul Davies and Niels H. Gregersen (Cambridge, UK: Cambridge University Press, 2014), 385.

<sup>60</sup>Paul Davies, “Universe from Bit,” in *Information and the Nature of Reality*, ed. Paul Davies and Niels H. Gregersen (Cambridge: Cambridge University Press, 2014), 95.

<sup>61</sup>Keith Ward, “God as the Ultimate Informational Principle,” in *Information and the Nature of Reality*, ed. Paul Davies and Niels H. Gregersen (Cambridge: Cambridge University Press, 2014), 379.

In addition to current ideas related to the metaphysics of information, Dembski notes that the spirit of his approach to understanding reality has a long intellectual tradition. He writes,

In the late eighteenth and early nineteenth centuries, idealism was ascendant, identifying mind rather than matter as the fundamental reality. Both materialism and idealism are monistic, locating all of reality in a single principle, matter in the one case, mind in the other. But dualistic options also exist, such as Christian theism, which distinguishes between a nonmaterial God on the one hand and a created order on the other (a created order that includes but is not limited to matter).<sup>62</sup>

The materialism, idealism, and dualism of the eighteenth and nineteenth centuries can all trace their roots back to early Greek philosophy. Before Socrates, Greek philosophers introduced various metaphysical proposals for understanding the fundamental nature of reality. Thales, Anaximander, and Anaximenes were the first of philosophers from a city called Miletus, and they argued that ultimate reality could be reduced to one basic substance, whether water, air, or an indeterminate boundlessness. These early Milesian philosophers are often called material monists. The atomists, on the other hand, were materialists who rejected monism and proposed that ultimate reality consisted of an infinite number of bits. Pythagoreans suggested that reality reduces to numbers rather than something material. A crude resemblance exists between this Pythagorean doctrine and an information-first view of reality. Heraclitus built upon these earlier suggestions, arguing that a fiery *logos* governs reality, and Anaxagoras further proposed that the governing force was a mind. Such ideas were precursors to the current distinctions between idealism, materialism, and dualism, and Dembski's information-theoretic conception of reality could conceivably find a home within an idealist or a dualist worldview.

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<sup>62</sup>Dembski, *Being as Communion*, 6.

At the most basic level, Dembski's metaphysical project draws important distinctions between materialism and non-materialism, and then builds a case for non-materialism. Dembski claims this project is fairly broad, and therefore he aspires to find common cause with contemporary non-materialists like Nagel, a professed atheist.<sup>63</sup> The purpose of finding this common cause, according to Dembski, "is not because it is politically expedient in the controversy with Darwinian materialism but because theistic and naturalistic non-materialists are both attempting, without the blinders of materialism, to understand how teleology operates in nature."<sup>64</sup> Broadly speaking, Dembski's information-theoretic project is simply one alternative to materialism.

This broad information-theoretic project, however, can funnel into a position that is uniquely and persuasively aligned with general theism. In *Being as Communion*, Dembski emphasizes that he does not argue for a worldview that makes information primary. He instead argues that information is dependent upon a fundamental intelligence. Intelligence, therefore, is prime reality. Dembski explains,

I'm not arguing for the all-sufficiency of information as such because, in my view, information is, in the end, always the product of a creative intelligence. This would make intelligence rather than information the most basic metaphysical entity, placing all-sufficiency with intelligence rather than information. Indeed, as a theist, I regard an intelligent being, God, as the prime reality. The issue here, however, is not the primacy of intelligence or teleology for metaphysics. The issue, rather, is the primacy of information for science. I am arguing that information should

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<sup>63</sup>One might also refer to other metaphysical perspectives, such as pantheism or panentheism. Pantheism is simply a spiritual form of naturalism, so Dembski's critiques of naturalism would apply to pantheism. As for panentheism, Dembski argues that panentheism is not consistent with Christian theism, and it still faces many of the problems of naturalism. According to a panentheistic conception of God, God is dependent upon matter for his existence. On this view, mind (the mind of God) is reduced to matter. According to Christian theism, however, God is the cause of matter. It does seem, therefore, that materialist monism, idealist monism, and theistic dualism are the three most viable metaphysical options. For more discussion on this topic, see Dembski, *The Design Revolution*, 175-76.

<sup>64</sup>Dembski, *Being as Communion*, 65-66.

properly be regarded as the prime entity and object of study in science, displacing matter from its current position of eminence.<sup>65</sup>

The distinction between intelligence and information is significant for the general purposes of the ID project, and this distinction is especially significant for understanding the ethical issues related to the problem of dysteleology. To argue that information is primary for scientific investigation is analogous to arguing that information is primary for ethical investigation. In other words, if ethicists are not seeking to discover moral information, then it becomes difficult to articulate the content of their studies. This difficulty is perhaps the main reason why moral relativism has influenced many naturalists and materialists.

As a Christian theologian, Dembski assumes that the fundamental intelligence of reality is the God of Christianity. This assumption is noteworthy because it provides valuable content for grasping the nature of moral information. In *Being as Communion*, Dembski states that information, “presupposes intelligence, language, and semantics.”<sup>66</sup> The observable universe, consequently, is observable information.<sup>67</sup> In Dembski’s earlier book on science and theology, he connects the concept of information with his understanding of the Divine *logos*:

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<sup>65</sup>Dembski, *Being as Communion*, 91. Elsewhere, Dembski explains, “From the vantage of materialism, matter invariably swallows up intelligence, reducing it to the motions and modifications of matter. On the other hand, from the vantage of even the most generic theism (and I include here deism, process theism, pantheism, and pantheism in addition to ethical monotheism), intelligence becomes a fundamental and irreducible feature of reality that has a say in everything. As a consequence, intelligence becomes interwoven throughout the fabric of reality, making it impossible to sever chance from intelligence or rule out that chance is the byproduct of intelligence. So the logic of one’s ultimate metaphysics pushes toward one view or the other, toward chance as devoid of intelligence or toward chance as an expression, albeit indirect, of intelligence. Thus, I would say, the generic theist may regard chance as, in every case, a byproduct of intelligence” (ibid., 137).

<sup>66</sup>Ibid., 17.

<sup>67</sup>The notion of observing information may seem counterintuitive, but Dembski argues that this notion is likely true if the Christian doctrine of creation is affirmed. Dembski explains, “If creation is, [as the Judeo-Christian tradition teaches], an effected word spoken by God, then creation itself is a primal informational act. Moreover, the outworking of this creation in all its details will then be a series of echoes stemming from that primal act. Given such an account of creation, the search for a substratum of reality more basic than information would be futile. In any case, such a search will always be circular, never getting outside the circle of information” (ibid., 89).

Let us . . . turn to the creation of the world as treated in Scripture. The first thing that strikes us is the mode of creation. God speaks and things happen. There is something singularly appropriate about this mode of creation. Any act of creation is the concretization of an intention by an intelligent agent. Now in our experience the concretization of an intention can occur in any number of ways. Sculptors concretize intentions by chipping away at stone, musicians by writing notes on lined sheets of paper, engineers by drawing up blueprints. But in the final analysis all concretizations of intentions can be subsumed under language. For instance, a precise enough set of instructions in a natural language will tell the sculptor how to form the statue, the musician how to record the notes and the engineer how to draw up the blueprints. In this way language becomes the *universal medium* for concretizing intentions.<sup>68</sup>

Dembski continues,

The language that proceeds from God's mouth in the act of creation is not some linguistic convention. Rather as John's Gospel informs us, it is the divine *Logos*, the Word that in Christ was made flesh and through whom all things were created. This divine *Logos* subsists in himself and is under no compulsion to create. For the divine *Logos* to be active in creation, God must *speak* the divine *Logos*. This act of speaking always imposes a self-limitation on the divine *Logos*. There is a clear analogy here with human language. Just as every English utterance rules out those statements in the English language that were not uttered, so every divine spoken word rules out those possibilities in the divine *Logos* that were not spoken. Moreover, just as no human speaker of English ever exhausts the English language, so God in creating through the divine spoken word never exhausts the divine *Logos*.<sup>69</sup>

Dembski's metaphysical concept of information, therefore, is deeply linked to his theological understanding of God speaking creation into existence. Nature is thus conceived as language, rather than a brute fact. Given this conception of nature, one can better articulate the substance of moral facts.

To understand why this is so, consider the role language plays in rendering the world intelligible. Intelligent agents learn by using language to comprehend and describe truths about reality. This learning process involves assigning words to objects, occurrences, and patterns. In the realm of moral facts, however, this learning process is

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<sup>68</sup>Dembski, *The Bridge*, 224-25.

<sup>69</sup>*Ibid.*, 225.

perhaps more difficult to describe. Do labels like “good” and “evil” describe objective facts in the universe, or do they merely describe subjective states within an intelligent agent? Dembski’s insights regarding the divine *Logos* provide some direction on this question. He explains,

Having considered the role of *logos* in creating the world, I want to next consider its role in rendering the world intelligible. To say that God through the divine *Logos* acts as an intelligent agent to create the world is only half the story. Yes, there is a deep and fundamental connection between God as divine *Logos* and God as intelligent agent . . . . The world, however, is more than simply the product of an intelligent agent. In addition, the world is intelligible. We see this in the very first entity that God creates – light. With the creation of light, the world becomes a place that is conceptualizable and to which values can properly be assigned. To be sure, as God increasingly orders the world through the process of creation, the number of things that can be conceptualized increases, and the values assigned to things become refined. But even with light for now the only created entity, it is possible to conceptualize light, distinguish it from darkness and assign a positive value to light, calling it good. The world is thus not merely a place where God’s intentions are fulfilled but also a place where God’s intentions are intelligible. Moreover that intelligibility is as much moral and aesthetic as it is scientific.<sup>70</sup>

Dembski maintains that this *logos* perspective on creation dissolves the fact-value distinction, and thus makes moral values discernable.<sup>71</sup> God’s language describes the way the world ought to be, and human language is a divine gift for helping us to understand the world.<sup>72</sup> Given the divine *Logos* and the Christian doctrine of the *imago dei*, one can further imagine how subjective human moral judgments might correspond to objective moral facts.

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<sup>70</sup>Dembski, *The Bridge*, 229.

<sup>71</sup>Dembski writes, “God, in speaking the divine *Logos*, not only creates the world but also renders it intelligible. This view of creation has far-reaching consequences. For instances, the fact-value distinction dissolves opposite God’s act of creation – indeed what is and what ought to be unite in God’s original intention at creation” (ibid., 230).

<sup>72</sup>Ibid., 230. Dembski further explains, “Human language . . . enables us to express accurate claims about God and the world. It is vitally important for the Christian to understand this point. Human language is not an evolutionary refinement of grunts and stammers formerly uttered by some putative apelike ancestors. We are creatures made in the divine image. Human language is therefore a divine gift that mirrors the divine *Logos*” (ibid.).

## Conclusion

My two goals in this chapter were (1) to demonstrate that Dembski's critiques of naturalism and materialism provide formidable reasons to reject both naturalism and materialism and (2) to introduce Dembski's information-theoretic account of reality as a viable alternative to naturalism and materialism. I have argued, with Dembski, that both naturalism and materialism undermine the projects of epistemology and ethics by reducing human agency to impersonal bio-chemical processes in the brain. On the other hand, Dembski's alternative worldview grounds knowledge and ethics in a knowing intelligence.<sup>73</sup> This alternative worldview provides the foundation for properly assessing Ayala's dysteleological critique of ID.

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<sup>73</sup>Dembski writes, "Intelligent agency is therefore in no sense prior to or independent of nature. Intelligent agency is neither sui generis nor basic. Intelligent agency is a derivative mode of causation that depends on underlying naturalistic—and therefore unintelligent—causes. Human agency in particular supervenes on underlying natural processes, which in turn are unusually identified with brain function." Dembski, *The Bridge*, 214.

## CHAPTER 6

### CONCLUSION: MAKING DARWIN A GIFT?

#### **Introduction**

In the previous two chapters, I articulated Dembski's method for detecting design, examined his critiques of materialism and naturalism, and briefly explained his information-theoretic account of reality. Those chapters provide the groundwork for my central argument in this concluding chapter in which I argue that Darwin can be a gift for theologians trying to develop a natural theodicy, but only if he is understood teleologically. More specifically, I agree with Ayala that the mutation-selection mechanisms of evolution provide appropriate explanations for the existence of suboptimal design in biology. I disagree with Ayala's proposal, however, that Darwin solved this problem by removing teleology from the discussions about the natural world. Instead, I argue that Darwin is a gift to theodicy because he added a more robust understanding of natural processes, not because he subtracted design as a relevant mode of explanation in nature.

My argument in this chapter follows in two basic steps. First, I reassess Ayala's proposal that Darwin is a gift to theodicy in light of Dembski's ID project. I conclude that while Ayala's theodicy is useful, it can also be embraced by ID advocates. This first step represents a modest critique of Ayala's theological argument against ID. Second, I argue further that Ayala's evolutionary theodicy is intelligible if and only if he presupposes something similar to Dembski's information-theoretic conception of reality, which Dembski describes in the following paragraph.

To exist is to be in communion, and to be in communion is to exchange information. Accordingly, the fundamental science, indeed the science that needs to ground all other sciences, is a theory of communication, and not, as is widely supposed, an atomistic, reductionistic, and mechanistic science of particles or other mindless entities, which then need to be built up to ever greater orders of complexity by equally mindless principles of association, known as natural laws or algorithms or emergent properties or principles of self-organization. Within such a theory of communication, the proper object of study is not particles, but the information that passes between entities – entities in turn defined by their ability to communicate information. Accordingly, the metaphysical picture that I’m painting attempts to make good on the promise of John Wheeler, Paul Davies, and others that information is poised to replace matter “as the primary ‘stuff’ of the world” and that in information we have “finally arrived at the ‘right’ metaphor that will unify” the sciences.<sup>1</sup>

This second step is more ambitious as I try to demonstrate that Dembski is correct in his portrayal of reality, which suggests that his metaphysical outlook is as much a gift to Ayala’s evolutionary theodicy as Darwin is a gift to theodicy in general. If my second step fails to demonstrate this conclusion, however, it will still follow that Ayala’s theological critique of ID fails.

### **Reassessing Ayala’s Proposal That Darwin Is a Gift**

The most fruitful aspect of Ayala’s evolutionary theodicy is the claim that natural selection working on random mutations provides an adequate explanation for design in biology—including suboptimal design. This claim emphasizes the role of chance and necessity as the sole cause of suboptimal design. While I do not fully agree with Ayala’s argument, I do think he points one in the right direction regarding suboptimal design. The mutation-selection processes of evolution do provide theologians with relevant mechanisms for explaining the ostensible dysfunctions and imperfections of

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<sup>1</sup>William A. Dembski, *Being as Communion: A Metaphysics of Information* (Burlington, VT: Ashgate, 2014), xii-xiv.

the natural world. That is, Ayala's argument removes the requirement for theologians to explain suboptimal design in teleological terms.<sup>2</sup>

This is not to say, however, that Ayala's solution provides a defeater for ID. As seen in previous chapters, neither Dembski nor any other ID advocate rejects chance or necessity as appropriate modes of explanation in biology. The pertinent issue is whether natural causes are supplemented by design.<sup>3</sup> ID advocates have never argued that every aspect of nature is designed. Furthermore, they also do not argue that nature exhibits optimal design. Intelligent Design argues instead that some features of nature are intentionally, whether optimally or suboptimally, designed, and teleological explanations are therefore appropriate modes of explanation in science. Dembski clarifies,

Many biologists claim that biological systems are not actually designed and thus attempt to assimilate all biological design to either apparent or optimal design (Stephen Jay Gould, Richard Dawkins, and Francisco Ayala are masters of this strategy). This is an evasive strategy because it avoids the central question that needs to be answered, namely, the question of actual design. The automobiles that roll off the assembly lines in Detroit are intelligently designed in the sense that actual human intelligences are responsible for them. Nevertheless, even if we think Detroit manufactures the best cars in the world, it would still be wrong to say that they are optimally designed. Nor is it correct to say that they are only apparently designed.<sup>4</sup>

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<sup>2</sup>Of course, this proposal is not entirely novel. Paley certainly recognized that design is not the only mode of causation, which is demonstrated in his claim that chance explains wens, warts, moles, and pimples. William Paley, *Natural Theology* (Oxford: Oxford University Press, 1802), 38. Darwin's theory of natural selection simply demonstrates how more complex features may also arise through natural processes.

<sup>3</sup>Dembski, *The Design Revolution*, 75.

<sup>4</sup>Dembski, "What Intelligent Design is Not," 8. In *No Free Lunch*, Dembski explains this point in the introduction: "A possible terminological confusion over the phrase 'intelligent design' needs to be cleared up. The confusion centers on what the adjective 'intelligent' is doing in the phrase 'intelligent design.' 'Intelligent' can mean nothing more than being the result of an intelligent agent, even one who acts stupidly. On the other hand, it can mean that an intelligent agent acted with consummate skill and mastery. Critics of intelligent design often understand the 'intelligent' in intelligent design in the latter sense and thus presume that intelligent design must entail optimal design. The intelligent design community, on the other hand, understands the 'intelligent' in intelligent design simply to refer to

Dembski's clarification leaves ID advocates with two possible explanations for suboptimal design. First, an ID advocate may simply argue that some examples of actual design are suboptimally designed. This would not diminish the reality of actual design, since every human artifact is, in some sense, suboptimal. The mere presence of suboptimal design, then, does not remove the reality of actual design. Dembski further explains,

No real designer attempts optimality in the sense of attaining perfect design. Indeed, there is no such thing as perfect design. Real designers strive for *constrained optimization*, which is something altogether different . . . . Design by intelligent agency [furthermore] does not preclude evil. A torture chamber replete with implements of torture is designed, and the evil of its designer does nothing to undercut the torture chamber's design.<sup>5</sup>

Whether one agrees or disagrees with Dembski's claim that there is no such thing as perfect design, he is correct to note that design by an intelligent agency does not preclude suboptimal design.

A second explanation for suboptimal design is to simply endorse Ayala's theodicy, namely, that imperfect design is the result of natural selection working on random mutations. Given this solution, theologians have no need to explain, for example, why God would place ganglion and bipolar cells in front of the photoreceptors in the retina.<sup>6</sup> Perhaps chance and necessity really do explain some features of the human

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intelligent agency (irrespective of skill, mastery, or cleverness) and thus separates intelligent design from optimality of design." Dembski, *No Free Lunch*, xvi-xvii.

<sup>5</sup>Dembski, "What Intelligent Design is Not," 8. He further writes, "Just because we can always imagine some improvement in design doesn't mean that the structure in question wasn't designed, or that the improvement can be effected, or that the improvement, even if it could be effected, would not entail deficits elsewhere. And, of course, the charge of poor design may simply be mistaken. The success of the suboptimality objection comes not from science at all, but from shifting the terms of the discussion from science to theology. In place of *How specifically can an existing structure be improved?*, the question instead becomes *What sort of deity would create a structure like that?*" Ibid., 9.

<sup>6</sup>This is not to say that God did not design the retina this way, only that theologians are not required to defend this claim. As far as I can tell, a Christian theologian could reasonably argue that God designed every aspect of the human eye, or he could argue that the eye developed through the interplay of chance, necessity, and design.

eye. Dembski thus argues that a “design theorist is not committed to every biological structure being designed.”<sup>7</sup> He explains,

Intelligent design is not a theory about the frequency or locality or modality by which a designing intelligence intervenes in the material world. It is not an interventionist theory at all. Indeed, intelligent design is perfectly compatible with all the design in the world coming to expression by the ordinary means of secondary causes over the course of natural history, much as a computer program’s output comes to expression simply by running the program (and thus without monkeying with the program’s operation). In fact, one way to think of the secondary causes responsible for biological evolution is as intelligently designed programs whose computational environment is the universe and whose operating system is the laws of physics and chemistry.<sup>8</sup>

Non-interventionist theories of evolution, therefore, are perfectly consistent with ID, provided that actual design is never negated. Dembski even argues that such positions are compatible with Christian theism when he writes,

Christian theism is compatible with God delegating to nature many of its powers (cf. the medieval distinction between primary and secondary causes, secondary causes operating under their own power, instituted by the primary cause, God). In fact, it’s not clear that Christianity requires direct divine intervention in anything except for what pertains to the salvation of humanity (e.g., the Incarnation, Resurrection, sacraments, saving faith). All of natural history, insofar as it can be distinguished from salvation history, may thus result from natural powers implanted by God but which are free from direct divine control. Christian thinkers are far from united on this point, some preferring a hands-on interventionist deity even in natural history, others preferring a hands-off laissez-faire deity. In any case, theism, whether Christian or otherwise, allows a great deal of latitude to the nature of nature, not imposing a priori constraints on nature but letting inquiry and evidence dictate what nature is and what causal power operates in it.<sup>9</sup>

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<sup>7</sup>Dembski, “What Intelligent Design is Not,” 10.

<sup>8</sup>William A. Dembski, “Making the Task of Theodicy Impossible? Intelligent Design and the Problem of Evil,” in *The Evolution of Evil*, ed. Gaymon Bennett et al. (Göttingen, Germany: Vandenhoeck & Ruprecht, 2008), 221-22.

<sup>9</sup>Dembski, *Being as Communion*, 65.

Dembski's articulation and explanation of ID provides reason to doubt Ayala's dysteleological critique of ID, given that ID advocates can also utilize Ayala's answer to suboptimal design.<sup>10</sup>

### **Ayala's Fundamental Mistakes**

Ayala's critique suffers from a greater problem, however. Ayala contends that his evolutionary theodicy is grounded in a non-teleological conception of nature. In other words, he claims that Darwin's theory refutes any argument for actual design in biology, and, consequently, Darwin demonstrates that suboptimal design in biology is an illusion. Purported examples of suboptimal design are not immoral, therefore, because a personal agent did not create such examples. Only personal agents can commit immoral acts, but Darwin's great discovery presumably revealed that all aspects of biological life, including imperfections, are the result of unguided and impersonal physical processes. Ayala's solution to the problem of dysteleology, then, is simply to state that there is no problem by arguing that God is not responsible for imperfect design.

Ayala's solution, however, only addresses surface-level problems. Christian theologians have traditionally affirmed a doctrine of creation and providence, even though there are various disagreements regarding how to articulate such doctrines. Leaving those disagreements aside, even minimalistic doctrines of creation and providence show that one must take the problem of natural evil, including the problem of

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<sup>10</sup>Dembski writes, "Dysteleology might present a problem if all design in nature were wicked or incompetent and continually flouted our moral and aesthetic yardsticks. But that is not the case. To be sure, there are microbes that seem designed to do a number on the mammalian nervous system and biological structures that look cobbled together by a long trial-and-error evolutionary process. But there are also biological examples of nano-engineering that surpass anything human engineers have concocted or entertain hopes of concocting. Dysteleology is primarily a theological problem. To exclude design from biology simply because not all examples of biological design live up to our expectations of what a designer should or should not have done is an evasion. The problem of design in biology is real and pervasive, and needs to be addressed head on and not sidestepped because our presuppositions about design happen to rule out imperfect design. Nature is a mixed bag. It is not William Paley's happy world of everything in delicate harmony and balance. It is not the widely caricatured Darwinian world of nature red in tooth and claw. Nature contains evil design, jerry-built design, and exquisite design. Science needs to come to terms with design as such and not dismiss it in the name of dysteleology." Dembski, *No Free Lunch*, xvi.

suboptimal design, deeper than Ayala's surface-level solution. If God created and governs the natural world, then surely God bears some responsibility for dysteleology. Ayala's solution only pushes the problem of dysteleology back a step by arguing that God is not *directly* responsible for suboptimal design. Chris Doran explains,

Ayala suggests that Christians are home free now that the "bad" design we see in the universe can be "blamed on/attributed to" evolutionary processes rather than God. It seems to me that the question that Ayala avoids is the question that still must be asked: Who created the laws that govern evolutionary processes? If we pursue this avenue of thought, then the issue is not whether the design of the universe or particular features in our universe are bad, imperfect, or cruel, but rather whether God instilling the universe with the freedom to "create" itself through evolutionary processes is really worth it.<sup>11</sup>

Doran highlights what one might call *the hard problem of dysteleology*.<sup>12</sup> Why would God create a world governed by chance and necessity that eventually gives rise to suboptimal design and other cases of natural evil? Ayala's initial explanation does not address this deeper problem.

This is not to say, however, that Ayala never attempts to address this problem. In his book *Am I a Monkey?*, Ayala acknowledges this deeper problem and offers a brief response:

Some anti-religious authors, as well as other critics, have argued that the process of evolution by natural selection does not discharge God's responsibility for the dysfunctions and cruelties of the living world because, for people of faith, God is the Creator of the universe and thus would be accountable for its consequences, direct or indirect. If God is omnipotent, the argument would say, He could have

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<sup>11</sup>Chris Doran, "From Atheism to Theodicy to Intelligent Design: Responding to the Work of Francisco J. Ayala," *Theology and Science* 7, no. 4 (2009): 340.

<sup>12</sup>What I am calling the hard problem of dysteleology is similar to what David Chalmers calls the hard problem of consciousness. Chalmers argues that many theorists working on the problem of consciousness are only looking at superficial correlations between brain states and mental states, whereas the hard problem of consciousness seeks to determine why any configuration of neural firings would give rise to subjective experience. Similarly, Ayala is addressing superficial explanations for how chance and necessity might explain examples of suboptimal design. Such explanations might address the easy problem of dysteleology, but they do not address the hard problem. Even if Ayala's answers are correct, they do not explain why God would create a world, governed by chance and necessity, that eventually gives rise to suboptimal structures in biology. This later mystery is what I mean by "the hard problem of dysteleology."

created a world where such things as cruelty, predation, and human miscarriages would not occur.<sup>13</sup>

Ayala then offers a potential solution:

A world of life with evolution is much more exciting; it is a creative world where new species arise, complex ecosystems come about, and humans have evolved. This account will not satisfy some people of faith, and many unbelievers will surely find it less than cogent. But I am suggesting that it may provide the beginning of an explanation for many people of faith.<sup>14</sup>

I will not evaluate the merits of Ayala's proposal here, but I will draw attention to one crucial point.<sup>15</sup> Ayala's deeper theodicy assumes a teleological outlook on creation. In other words, God designed a world governed by unguided evolutionary processes because "a world of life with evolution is much more exciting." This theodicy is not intelligible without teleology. Dembski recognizes this point and compares Ayala's theodicy with a mugger who "brutalizes someone with his own hands" versus a mugger who "employs a vicious dog on a leash."<sup>16</sup> In both cases, the mugger is held responsible.

Thus, Ayala's solution to the easy problem of dysteleology is to remove teleology from biology, but his solution to the hard problem of dysteleology invokes a

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<sup>13</sup>Francisco J. Ayala, *Am I a Monkey? Six Big Questions about Evolution* (Baltimore: The Johns Hopkins University Press, 2010), 78.

<sup>14</sup>*Ibid.*, 80

<sup>15</sup>For a persuasive critique of Ayala's suggestion, see Oliver Putz, "Love Actually: A Theodicy Response to Suffering in Nature. In Dialogue with Francisco Ayala," *Theology and Science* 7, no. 4 (2009): 345-361. Putz writes, "In Ayala's model, the subject of the creative that seems to be the focus of divine interest is the universe. It is this cosmic creativity, then, that needs to be preserved, even at the price of the suffering of individual life within it. But this conflicts with traditional doctrines of God according to which God has an invested interest in each and every one creature, animated or not, sentient or non-sentient" (349).

<sup>16</sup>William A. Dembski, *The End of Christianity: Finding a Good God in an Evil World* (Nashville: B & H, 2009), 164. Dembski writes, "In turning the table on [ID], Ayala has in fact turned it 360 degrees. The table is therefore back to where it was before, and the problem he meant to shift to [ID] confronts him still. Ayala worries that a God who creates by direct intervention must be held accountable for all the bad designs in the world. Ayala's proposed solution is therefore to have God set up a world in which evolution (by natural selection) brings about bad designs. But how does this address the underlying difficulty, which is that a creator God has set up the conditions under which bad design emerges? In the one case, God acts directly; in the other, indirectly. But a creator God, as the source of all being, is as responsible in the one case as in the other" (*ibid.*, 163).

deeper teleological explanation, namely, that God purposed a world governed by unguided evolution because such a world is more exciting than a world without unguided evolution. At the deepest level, teleology is needed to ground Ayala's theodicy.<sup>17</sup>

### **Teleology and Evolutionary Theodicies**

When I evaluate the merits of Ayala's evolutionary theodicy, therefore, I filter his theodicy through a teleological lens. This filtering seems appropriate both from a theological and philosophical perspective. As for theology, many theologians respond to the problem of natural evil by factoring in eschatological considerations. If theological concepts like the hope of salvation, redemption, or new creation play any role in our understanding of predation, animal suffering, dysfunctions, and suboptimal design, then teleology cannot be removed from the discussion. Furthermore, Christopher Southgate writes,

The evolutionary process, as Arthur Peacocke notes, "is characterized by propensities toward increase in complexity, information-processing and storage, consciousness, sensitivity to pain and even self-consciousness." It is hard . . . to imagine that these longer-term propensities are not also reflections of the divine desire. To deny the existence of that divine desire to relate to organisms with more and more complex consciousness is to be unable to say that a primate's life contains greater value than its most primitive evolutionary ancestors . . . . The scheme I am developing here is a strongly teleological one. It affirms the value of every creature, both as a good of itself and as a vital component of an ecosystem.<sup>18</sup>

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<sup>17</sup>One could also argue that Ayala's solution to the easy problem also presupposes teleology. Dembski writes, "The line I find most convincing is that evil always 'parasitizes' good. Indeed, all our words for evil presuppose a good that has been perverted. Impurity presupposes purity, unrighteousness presupposes righteousness, deviation presupposes a way from which we've departed, sin presupposes a target that was missed . . . . Dysteleology, the perversion of design in nature, is real. It is evident all around us. But how do we explain it? The scientific naturalist explains dysteleology by claiming that the design in nature is only apparent, that it arose through mutation and natural selection (or some other natural mechanisms), and that imperfection, cruelty, and waste are to be fully expected from such mechanisms." Dembski, "What Intelligent Design is Not," 10-11. If evil always "parasitizes" good, then one could also argue that suboptimal design always "parasitizes" actual design.

<sup>18</sup>Christopher Southgate, *The Groaning of Creation: God, Evolution, and the Problem of Evil* (Louisville: Westminster John Knox Press, 2008), 71.

Southgate rightly recognizes that his particular evolutionary theodicy embraces teleology when attempting to explain the existence of natural evil.

As for philosophy, teleology still seems significant. Ayala's central argument is that Darwin is a gift to theodicy because he removed teleological explanations from biology. This bold proposal brings up many unanswered questions. How exactly did Darwin's contribution of natural selection distinguish teleological explanations from non-teleological explanations in biology? Is modern biology really in the business of ruling out teleological causes? Is Ayala making a scientific argument or philosophical argument when he rules out teleology?

One of the substantial critiques of ID is that questions explored by ID advocates are not scientific questions, but these critiques can be raised against ID critics like Ayala as well. There are no scientific arguments establishing that chance and necessity are the only modes of causation in the natural world. One could argue that chance and necessity are the only modes of explanation appropriate for science (methodological naturalism) but that is a separate philosophical argument regarding the proper demarcations of science. Questions pertaining to the ontology of chance, necessity, and design are metaphysical questions about the nature of nature. Intelligent Design advocates like Dembski contend that design is a fundamental mode of causation, perhaps more fundamental than both chance and necessity.

One of my more ambitious arguments in this chapter is that Dembski's basic design assumption, which is denied by Ayala, is necessary to make Ayala's solution to suboptimal design intelligible. To demonstrate this point, I put forward two propositions for consideration. First, Dembski's information-theoretic conception of reality provides epistemic warrant for thinking that moral facts exist and are discoverable. Second, the concept of design provides epistemic warrant for thinking that human conscious agents are capable of discovering moral facts, whereas *chance and necessity alone* are unable to

provide such a warrant. If both of these propositions are defensible, then there is good reason to conclude that any coherent evolutionary theodicy will require teleology.

### **Information and Moral Realism**

To defend this first proposition, I contend that any evolutionary theodicy, including solutions to the problem of suboptimal design, require a basic commitment to moral realism. That is, moral facts are objective and grounded in a reality outside of human perception and judgment. If one cannot defend this claim, then there is no basis for making moral judgments about the natural world. In other words, meaningful moral judgments about nature's design suggest that nature reveals moral information. But how could nature reveal moral information if nature is governed solely by chance and necessity? Materialists and naturalists who use the problem of natural evil as a defeater for theism must answer this question.

Dembski, on the other hand, turns the question on its head by arguing that information, as opposed to matter, is fundamental. According to this metaphysical outlook, chance, design, and necessity are all appropriate modes of explanation when examining the natural world. Dembski writes, "Information . . . tends to be conceived in material terms, as a property of matter. But what if information cannot be reduced to matter? To turn the tables even more sharply, what if matter itself is an expression of information?"<sup>19</sup> This counterintuitive question highlights a crucial issue underlying moral realism and the problem of dysteleology. If materialism really is the correct conception of reality, then a moral fact must be conceived in material terms as a property of matter. And yet, moral facts are deeply connected to personal agency. It seems incoherent, in other words, to talk about moral values without referencing a moral

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<sup>19</sup>Dembski, *Being as Communion*, 1.

valuer.<sup>20</sup> But what is a moral valuer if not a personal agent? Disconnecting moral facts from conscious judgments makes it incompressible to think about moral facts in the first place.

To demonstrate why moral facts must be connected to conscious judgments, one needs to articulate clearly the concept of a moral fact. Doing this is much more difficult than, say, articulating a physical fact. Physical facts are somewhat easy to define within a materialistic framework. Put crudely, a physical fact occupies space and possesses mass. One can see physical facts. One can hold physical facts. There is nothing apparently mysterious about physical facts. Moral facts, however, do seem mysterious when conceived in material terms. One does not see moral facts nor can one hold moral facts. How then can one clearly articulate a moral fact?

I argue that this question is much less difficult to answer if something similar to Dembski's information-theoretic conception of reality is correct. Given his alternative perspective on reality, moral facts might be defined as a particular kind of information typically embodied in material objects or events. More specifically, moral information realizes moral possibilities by intentionally ruling out immoral possibilities.<sup>21</sup> Put differently, moral facts are deliberate forms of communication or moral judgments that are, in principle, recognized by other personal agents. These moral judgments require choice, and the distinction between choice and other forms of contingency is similar to the distinction between agency and non-agency. Without agency, moral judgments cannot be communicated. And without the communication of moral judgments, moral facts or information cannot exist.

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<sup>20</sup>Kevin Delapp critiques this view because he argues that it would make moral values contingent upon human agents, thus undermining his commitment to moral realism. See Kevin Delapp, *Moral Realism* (New York: Bloomsbury Academic, 2013), 13. He further utilizes Plato's *Euthyphro* to argue that moral facts must exist independent of personal agency.

<sup>21</sup>Dembski defines information generally as "about realizing possibilities by ruling out others." Dembski, *Being as Communion*, 19.

Dembski's information theoretic conception of reality thus makes it possible to discover moral information. The communicating of moral information occurs within embodied objects or events. Dembski defines matter as the medium for information, and when pertaining to moral facts, matter is the medium of moral information.<sup>22</sup> Given this outlook, one can observe a natural event and, in principle, make an intelligible moral judgment about that event. To offer an example, consider Quentin Smith's story about his moral indignation regarding the reality of predation:

Not long ago I was sleeping in a cabin in the woods and was awoken . . . by the sound of a struggle between two animals. Cries of terror and extreme agony rent the night, intermingled with the sounds of jaws snapping bones and flesh being torn from limbs . . . . A clearer case of a horrible event in nature, a natural evil, has never been presented to me. It seemed to me self-evident that the natural law that animals must savagely kill and devour each other in order to survive was an evil natural law and that the obtaining of this law was sufficient evidence that God did not exist.<sup>23</sup>

Smith's perception of this event as horrible and evil event is noteworthy. What metaphysical presuppositions about reality make Smith's perception a reliable guide to the external world? Smith certainly has a moral perception, but that does not mean that his perception corresponds to a moral reality. This is why Kenneth Miller argues Smith's perceptions are irrelevant because nature does not contain moral facts. The brutality of life, according to Miller, "is in the eye of the beholder."<sup>24</sup> He explains,

Could evolution really be so cruel as to require [...] an apology? To answer that question we have to keep two things in mind. The first is that cruelty is relative. As a New Englander, I enjoy few things more than a lobster dinner, especially at the end of a long summer day. The preparation of that meal, from the point of view of the lobster, is an act of unmitigated cruelty, perpetrated by me, the cook. The cats patrolling our barn are lovable family pets, but I assure you that their actions in

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<sup>22</sup>Dembski, *Being as Communion*, 97.

<sup>23</sup>Quentin Smith, "An Atheological Argument from Evil Natural Laws," *International Journal for Philosophy of Religion* 29, no. 3 (1991): 159-74.

<sup>24</sup>Kenneth Miller, *Finding Darwin's God: A Scientist's Search for Common Ground between God and Evolution* (New York: HarperCollins, 1999), 246.

keeping that barn vermin-free meet the highest standards of viciousness. Like beauty, the brutality of life is in the eye of the beholder.<sup>25</sup>

Miller's sentiment parallels Ayala's natural theodicy, contending that natural events are impersonal material events, and do not communicate moral information. When Smith calls such events evil, therefore, he is inappropriately ascribing moral properties to non-moral events.

If something like Dembski's information-theoretic account of reality is correct, however, then Smith's moral intuitions about natural evil are intelligible. Not only does Smith have moral perceptions, but his perceptions may also correspond to objective moral information. Predation-events, various examples of suboptimal design, and all natural occurrences have the potential of communicating moral information. This makes moral facts about nature discoverable. If moral facts were reducible to matter, then Miller's claim that the brutality of life is in the eye of the beholder would be correct. It is not clear, though, why such events should be reducible to matter.

### **ID and Conscious Moral Judgments**

The materialist problem gets worse when one considers the role human agents have in making conscious moral judgments. To claim that moral facts are discoverable in principle does not entail that human agents are capable of discovering such facts. Such an entailment assumes that one's cognitive faculties are calibrated for detecting moral facts in the external world. Given materialism, this assumption is unwarranted for two reasons. First, the materialist has yet to solve the mystery of consciousness, which John Searle articulates in the following question: "How exactly do brain processes cause conscious states and how exactly are those states realized in brain structures?"<sup>26</sup>

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<sup>25</sup>Miller, *Finding Darwin's God*, 245-46.

<sup>26</sup>John R. Searle, "Consciousness," in *The Nature of Nature: Examining the Role of Naturalism in Science*, ed. Bruce Gordon and William Dembski (Wilmington, DE: Intercollegiate Studies Institute, 2011), 727.

Materialists have certainly attempted to answer this question, but so far their suggestions are inconclusive. Searle, for example, answers his own question by stating that consciousness is “a biological phenomenon in exactly the same sense as digestion, growth, or photosynthesis.”<sup>27</sup> He compares the mystery of consciousness to the mystery of the liquidity of water. When one understands the concept of liquidity, one realizes that the alleged mystery is superficial. Liquidity is not an additional substance added to water; rather, it is a particular state of the H<sup>2</sup>O molecules. Likewise, consciousness is not an additional substance added to brain function. Consciousness is simply a particular state of neurological firings in the brain. To distinguish mental states from brain states, then, is to explain the same event, only at a different level of explanation. Searle writes,

“The problem of consciousness” is the problem of explaining exactly how neurobiological processes in the brain *cause* our subjective states of awareness or sentience; how exactly these states are *realized in* the brain structures; and how exactly consciousness *functions* in the overall economy of the brain and therefore how it functions in our lives generally. If we could answer the causal questions – what causes consciousness and what does it cause—I believe the answers to the other questions would be relatively easy. That is, if we knew the whole causal story then such questions as “Where exactly are such and such conscious processes located in the brain, and why do we need them?” would fall into place. So stated, the problem of consciousness is a scientific research project like any other.<sup>28</sup>

He continues,

The mystery of consciousness will gradually be removed when we solve the biological problem of consciousness. The mystery is not a metaphysical obstacle to ever understanding how the brain works; rather the sense of mystery derives from the fact that at present we not only do not know how it works, but we do not even have a clear idea of how the brain *could* work to cause consciousness. We do not

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<sup>27</sup>Searle, “Consciousness,” 727. Searle defines consciousness as consisting of “inner, qualitative, subjective states and processes of sentience or awareness. Consciousness, so defined, begins when we wake in the morning from a dreamless sleep and continues until we fall asleep again, die, go into a coma, or otherwise become “unconscious.” It includes all of the enormous variety of the awareness that we think of as characteristic of our waking life. It includes everything from feeling a pain, to perceiving objects visually, to states of anxiety and depression, to working out crossword puzzles, playing chess, trying to remember your aunt’s phone number, arguing about politics, or to just wishing you were somewhere else” (ibid., 727-28).

<sup>28</sup>John R. Searle, *The Mystery of Consciousness* (New York: NYRB, 1997), 192-93.

understand how such a thing is even possible. But we have been in similar situations before. A hundred years ago it seemed a mystery that mere matter could be *alive*. And debates raged between mechanists who sought a mechanical, chemical explanation of life and vitalists who thought any such explanation was impossible, who thought that any explanation required us to postulate a “vital force,” an “elan vital” that stood outside of mere chemical processes and made life possible. Today it is hard for us even to recover the sense of difficulty our great-grandparents’ generation experienced over this issue. The mystery was resolved not just because the mechanists won and the vitalists lost the debate, but because we got a much richer conception of the mechanism involved. Similarly with the brain. The sense of mystery will be removed when we understand the biology of consciousness with the same depth of understanding that we now understand the biology of life.<sup>29</sup>

Searle’s approach to this problem is to propose that consciousness will be understood when cognitive scientists find the precise correlations between neurobiological processes in the brain and our subjective states. Once those correlations are made, the problem of consciousness is solved. Searle admits cognitive scientists are not close to completing this project, but he is confident that the work can be accomplished in time. The problem of consciousness, from Searle’s perspective, will eventually have a straightforward biological solution.

David Chalmers, however, is not confident that biology will reveal a straightforward solution. He argues that Searle’s project only advances the easy problem of consciousness. The easy problem of consciousness can be solved, in principle, by developing computational models that explain the precise relationships between neural mechanisms and particular functions.<sup>30</sup> Chalmers refers to this project as the search for neural correlates of consciousness (NCC). He explains,

A neural correlate of consciousness can be characterized as a minimal neural system that is directly associated with states of consciousness. Presumably the brain as a whole is a neural system associated with states of consciousness, but not every part of the brain is associated equally with consciousness. The NCC project aims to

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<sup>29</sup>Searle, *The Mystery of Consciousness*, 201.

<sup>30</sup>David J. Chalmers, *The Character of Consciousness* (New York: Oxford University Press, 2010), 7.

isolate relatively limited parts of the brain (or relatively specific features of neural processing) that correlate directly with subjective experience.<sup>31</sup>

Chalmers agrees that the NCC project is useful, but it cannot address the hard problem of consciousness, namely, why is the performance of certain brain functions accompanied by subjective experience?<sup>32</sup> Put differently, why would a particular configuration of neural activity give rise to a first-person perspective? Or how does one move from ontological objectivity to ontological subjectivity? Even if neurobiologists eventually map every brain state/mental state correlation, Chalmers argues that they will not arrive any closer to answering the hard problem of consciousness.

Thus, Chalmers maintains that those working on the problem of consciousness need to address this problem from a different perspective. Specifically, he argues that one needs to reject materialism and then introduce radically new ways of thinking about the fundamental aspects of reality.<sup>33</sup>

I suggest that a theory of consciousness should take experience as fundamental. We know that a theory of consciousness requires the addition of *something* fundamental to our ontology, as everything in physical theory is compatible with the absence of consciousness . . . . We will take experience itself as a fundamental feature of the world, alongside mass, charge, and space-time. If we take experience as fundamental, then we can go about the business of constructing a theory of experience . . . . This position qualifies as a variety of dualism as it postulates basic properties over and above the properties invoked by physics. But it is an innocent version of dualism, entirely compatible with the scientific view of the world. Nothing in this approach contradicts anything in physical theory; we simply need to add further *bridging* principles to explain how experience arises from physical processes. There is nothing particularly spiritual or mystical about this theory—its

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<sup>31</sup>Chalmers, *The Character of Consciousness*, 44.

<sup>32</sup>*Ibid.*, 8.

<sup>33</sup>Thomas Nagel argues that this hard problem of consciousness is a problem specifically when one presumes naturalism or materialism. He explains, “Consciousness is the most conspicuous obstacle to a comprehensive naturalism that relies only on the resources of physical science. The existence of consciousness seems to imply that the physical description of the universe, in spite of its richness and explanatory power, is only part of the truth, and that the natural order is far less austere than it would be if physics and chemistry accounted for everything. If we take this problem seriously, and follow its implications, it threatens to unravel the entire naturalistic world picture.” Thomas Nagel, *Mind & Cosmos: Why the Materialist Neo-Darwinian Conception of Nature is Almost Certainly False* (New York: Oxford University Press, 2012), 35.

overall shape is like that of a physical theory, with a few fundamental entities connected by fundamental laws. It expands the ontology slightly, to be sure, but Maxwell did the same thing. Indeed, the overall structure of this position is entirely naturalistic, allowing but that the universe ultimately comes down to a network of basic entities obeying simple laws and that there eventually may be a theory of consciousness cast in terms of such laws. If the position is to have a name, *naturalistic dualism* is a good choice.<sup>34</sup>

Chalmers' suggestion that consciousness is a fundamental feature of the world alongside mass, charge, and space-time, is the type of explanation that would be consistent with what I am suggesting in this chapter. I agree with Chalmers that conscious experience is best understood as a fundamental feature of the world, and it is therefore not reducible to something more fundamental.<sup>35</sup> I disagree with Chalmers, however, that consciousness exists alongside mass, charge, and space-time. As a theist, I propose that consciousness is actually more fundamental than mass, charge, and space-time. As a Christian, I further propose that humans are created in the image of God, and thus human consciousness is derived from the *imago dei*.<sup>36</sup>

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<sup>34</sup>Chalmers, *The Character of Consciousness*, 17-18.

<sup>35</sup>ID advocates argue that design is a fundamental feature of the world, and is therefore not reducible to chance and necessity. As a naturalist, however, Chalmers's explanation is the best explanation I have heard from a naturalistic perspective. Other naturalists working on this problem, such as Daniel Dennett, take a different approach than Chalmers. Dennett also recognizes the problem, but he concludes that consciousness is merely an illusion (given naturalistic presuppositions). More specifically, Dennett rejects property dualism and argues that conscious states are not real. Chalmers rejects Dennett's suggestion, arguing that the datum of consciousness is too obvious to reject. He nevertheless argues that there are hard problems of consciousness that force us to reimagine our fundamental paradigms governing our current explanations of consciousness. He reasons that if a fundamental commitment to materialism has rendered it implausible to explain consciousness, then maybe it would be better to assume that consciousness is a fundamental aspect of reality. This is panpsychism, the idea that every aspect of reality has a certain degree of consciousness. Chalmers admits his view is a bit radical, since it forces us to conclude that objects like thermostats are conscious, but he also maintains his proposal is no more radical than Dennett's proposal that consciousness is merely an illusion.

<sup>36</sup>I specify human consciousness here because of the debate over animal consciousness. Chalmers' panpsychism would suggest that primitive forms of consciousness exist universally. Thus, all animals would have a degree of consciousness. Searle contends that humans and "higher animals are obviously conscious, but we do not know how far down the phylogenetic scale consciousness extends." He then asks, "Are fleas conscious, for example?" Searle, *The Mystery of Consciousness*, 5. Searle does not provide an answer to this question, claiming that it is not useful to worry about such inquiries. Given the argument I am making in this chapter, the question of animal consciousness is irrelevant to the strength or weakness of my case.

I mention this hard problem of consciousness because it seems fundamental for grounding moral reasoning. Consciousness is fundamental for making conscious judgments, and conscious judgments are fundamental for moral reasoning. If one cannot provide a workable solution to the hard problem of consciousness, therefore, one cannot ground moral reasoning. Materialism ostensibly makes this project impossible, or, at least, next-to-impossible.

In addition to providing a warrant for one's moral reasoning, one must also establish a correspondence between one's moral reasoning and moral facts. Such correspondence has not been established from a materialist perspective, and it likely cannot be established in principle. This is because chance and necessity are the only modes of causation available within a materialist worldview. Chance and necessity, furthermore, do not have the epistemic resources needed to justify the claim that objective moral information corresponds to our conscious moral judgments. As mentioned in chapter 5, apologists and philosophers have frequently demonstrated that naturalism and materialism are self-defeating and lead to the problem of epistemic skepticism. In *Warrant and Proper Function*, Alvin Plantinga provides a potential solution to this problem:

According to our notion of warrant, a belief *B* has warrant for you if and only if (1) the cognitive faculties involved in the production of *B* are functioning properly (and this is to include the relevant defeater systems as well as those systems, if any, that provide *propositional* inputs to the system in question); (2) your cognitive environment is sufficiently similar to the one for which your cognitive faculties are designed; (3) the triple of the design plan governing the production of the belief in question involves, as purpose or function, the production of true beliefs (and the same goes for elements of the design plan governing the production of input beliefs to the system in question); and (4) the design plan is a good one: that is, there is a high statistical or objective probability that a belief produced in accordance with the relevant segment of the design plan in that sort of environment is true.<sup>37</sup>

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<sup>37</sup>Alvin Plantinga, *Warrant and Proper Function* (New York: Oxford University Press, 1993), 194.

Plantinga's notion of warrant suggests that design is a necessary condition for thinking that one's cognitive faculties correspond to one's cognitive environment. This notion of warrant seems especially true when it comes to moral epistemology. To have moral knowledge about the natural world, one must first assume that natural world communicates moral information. Second, one must further assume that human judgments are produced by conscious moral agents. And last, one must assume that human judgments correspond to the moral information of reality. These three assumptions are consistent with Dembski's information theoretic account of reality, as well as Plantinga's design notion of warrant. Thus, a teleological worldviews provides a basis for thinking that moral realism is true, and it provides a foundation for developing a logically consistent evolutionary theodicy.

### **Does This Argument Apply to Ayala?**

Of course, one might respond to my argument by claiming that it only works with naturalists or materialists. Ayala is a theist. This is true, but Ayala's evolutionary theodicy assumes a non-teleological perspective on nature. This is perhaps most evident when considering his approach to mystery of consciousness. He writes,

In an important sense, the most distinctive human features are those expressed in the brain, those that account for the human mind and for human identity . . . . Humans (and humans alone, at least to any significant degree) have developed the capacity to adapt to hostile environments by modifying the environments according to the needs of their genes. The discovery of fire and the fabrication of clothing and shelter have allowed humans to spread from the warm tropical and subtropical regions of the Old World, to which we are biologically adapted, to the whole earth except for the frozen wastes of Antarctica. It was not necessary for wandering humans to wait until genes providing anatomical protection against cold temperatures by means of fur or hair would evolve. Nor are we humans biding our time in expectation of wings or gills; we have conquered the air and seas with artfully designed contrivances—airplanes and ships. It is the human brain (or rather, the human mind) that has made humankind the most successful living species by most meaningful standards.<sup>38</sup>

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<sup>38</sup>Ayala, *Am I a Monkey?*, 10.

Ayala continues,

One exciting biological discipline that has made great strides within the past two decades is neurobiology . . . . Much has been learned about how light, sound, temperature, resistance, and chemical impressions received in our sense organs trigger the release of chemical transmitters and electric potential differences that carry the signals through the nerves to the brain and elsewhere in the body . . . . But despite all [the] progress, neurobiology remains an infant discipline, at a stage of theoretical development comparable perhaps to that of genetics at the beginning of the twentieth century when Mendel's laws of heredity were rediscovered. Those things that count most remain shrouded in mystery: how physical phenomena become mental experiences (the feelings and sensations, called "qualia" by philosophers, that contribute the elements of consciousness) and how out of the diversity of these experiences emerges the mind, a reality with unitary properties such as free will and the awareness of self that persist throughout an individual's life. I do not believe that the mysteries of the mind are unfathomable; rather, they are puzzles that humans can solve with the methods of science and illuminate with philosophical analysis and reflection. And I will place my bets that, over the next half-century or so, many of these puzzles will be solved.<sup>39</sup>

At a functional level, there is no problem with Ayala's statement. But, at a deeper level, Ayala argues that consciousness has developed through an unguided process of biological evolution. Chance and necessity are the only modes of explanation needed in this explanation. Again, Ayala:

The theory of evolution manifests chance and necessity jointly intertwined in the stuff of life; randomness and determinism interlocked in a natural process that has brought forth the most complex, diverse, and beautiful entities in the universe: the organisms that populate the earth, including humans who think and love, endowed with free will and creative powers, and able to analyze the process of evolution itself that brought them into existence. This was Darwin's fundamental discovery, that there is a natural process that is creative, though not conscious.<sup>40</sup>

Ayala highlights chance and necessity, randomness and determinism. These are the fundamental modes of causation in the natural world, and he explicitly rejects teleology.<sup>41</sup>

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<sup>39</sup>Ayala, *Am I a Monkey?*, 11-12.

<sup>40</sup>Francisco J. Ayala, "Chance and Necessity: Adaptation and Novelty in Evolution," in *Evolving Dialogue*, ed. J. B. Miller (Harrisburg, PA: Trinity, 2001), 238.

<sup>41</sup>Dembski and Ayala mean different things by the word *teleology*. Ayala explains teleology as follows: "Automobiles exist and have particular configurations because they serve for transportation, and thus can be explained teleologically. Not all features of a car contribute to the purpose of efficient

The only objects that are designed, according to Ayala, are objects designed by human beings.<sup>42</sup> But this seems inconsistent. If the natural causes of chance and necessity are fundamental to nature, then human intelligence is ultimately reduced to chance and necessity. Ayala may want to reject this kind of reductionism, but his non-teleological outlook on the world cannot justify such a rejection. His worldview, therefore, seems to suffer from the same consequences as naturalism and materialism.

### Conclusion

After analyzing Ayala's evolutionary theodicy in light of Dembski's ID project, I conclude that there are many aspects of Ayala's worldview that are underdeveloped. Ayala wants to argue that natural evil and suboptimal design undermines the ID project, and yet his worldview cannot substantiate his objections. Thus, Ayala fails to provide a defeater for ID.

This still leaves open the theological problem of suboptimal design in biology. My goal in this dissertation was not to solve this problem, but rather to make sure philosophers and theologians frame the problem correctly. I conclude that Dembski's information-theoretic account of reality provides a better metaphysical framework for thinking about the problem of dysteleology than Ayala's non-teleological account. This framework affirms the existence of real teleology in nature, and it provides an epistemic

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transportation—some features are added for aesthetic or other reason. But as long as a feature is added because it exhibits certain properties—like appeal to the aesthetic preferences of potential customer—it may be explained teleologically. Nevertheless, there may be features in a car, a knife, or any other human-made object that need not be explained teleologically. That knives have handles is to be explained teleologically, but the fact that a particular handle is made of pine rather than oak might simply be due to the availability of material. Similarly, not all features of organisms have teleological explanations" (Ayala, *Chance and Necessity*, 241).

<sup>42</sup>Ayala writes, "Inanimate objects and processes (other than those created by humans) are not teleological because they are not directed toward specific ends, they do not exist to serve certain purposes" (ibid., 240).

foundation for utilizing evolutionary theodicies proposed by thinkers like Ayala's. Once teleology is affirmed, therefore, Darwin has a better chance of being a gift to theologians.

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## ABSTRACT

### DARWIN, DESIGN, AND DYSTELEOLOGY: A CRITICAL EVALUATION OF WILLIAM DEMBSKI AND FRANCISCO AYALA ON THE PROBLEM OF SUBOPTIMAL DESIGN

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This dissertation is a critical evaluation of two modern thinkers debating the idea of intelligent design (ID), William Dembski and Francisco Ayala. Specifically, it focuses on Ayala's major theological critique of intelligent design, namely, the problem of dysteleology. Chapter 1 provides an introduction to the problem of dysteleology as it relates to biology and offers a methodology for evaluating each thinker's resolution to this problem. Chapter 2 examines Ayala's scientific critique of ID, and chapter 3 looks at Ayala's theological critique of ID. Chapter 4 summarizes Dembski's method for detecting design, and chapter 5 outlines Dembski's critiques of naturalism and materialism as well as his information-theoretic account of reality. Finally, chapter 6 analyzes the strengths and weaknesses of Ayala's proposal that Darwin is a gift to theology in light of Dembski's information-theoretic account of reality.

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