

Is Intelligent Design the Answer to Darwinism? Marcos Eberlin's *Foresight* and the Limits of Irreducible Complexity as Scientific Paradigm

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Abstract. Marcos Eberlin is a chemist and mass spectrometer who advances in a new book a refined Intelligent Design (ID) theory hinging on “foresight,” or the apparent teleology and purpose discernible in biological, chemical, and other complex life systems. Repurposing older ID arguments, such as those of “irreducible complexity,” and introducing new examples of phenomena pointed to by other ID theorists, Eberlin makes a strong argument for mindful creation by a “superintellect”. But is ID sufficient to answer Darwinism? Does “foresight” go far enough in providing an alternative view of the origin of complex lifeforms? I argue that Eberlin, and other ID theorists, does not have a robust-enough definition of science to counter non-theistic theories of biology and biochemistry. An Aristotelian-Thomistic understanding of science allows us to go beyond the divide between ID and a-theistic theories and move the science-and-faith debate onto more solid ground.

Keywords: Intelligent Design; foresight; biochemistry; irreducible complexity; Aristotle; Aquinas.

Intelligent Design (ID) has maintained a toehold in an otherwise hostile scientific academy as a set of theories accommodating a theistic premise of purpose—“design”—to the universe. Championed by well-known scientists and philosophers such as William Dembski, Michael J. Behe (author of *Darwin’s Black Box*), Michael Denton, and Stephen C. Meyer (see Behe 1996; Dembski 2014; Denton 2016; Meyer 2021), Intelligent Design is rooted in the premise of “irreducible complexity,” or the apparent impossibility of complex biological systems and processes evolving from one-off, random genetic mutation events (for similar debates in other disciplines, see, e.g., Spitzer 2010; Hawking 2011; Barrow 2009; Weatherall 2016).

A new book from the Discovery Institute, the headquarters for much ID research and public engagement, refines “irreducible complexity,” which ID proponents hold up as an artifact of creation, into a more dynamic argument: “foresight,” implying not only the intelligent design of certain aspects of life but the anticipation of how those elements would work in an extraordinarily complex biological and environmental system. Marcos N. Eberlin’s *Foresight: How the Chemistry of Life Reveals Planning and Purpose*, is a brief explication of this new departure in ID. In many ways echoing the arguments advanced in Paul Davies’ *The Mind of God*, *Foresight* is a thematic exploration of inherent purpose and what might be called a “science-inflected teleology” in the life sciences and beyond. This is a short book, highly technical in places but aimed at the general public, which reveals the frontiers, and also the limits of current Intelligent Design arguments (Davies 1993).

Marcos N. Eberlin is former president of the International Mass Spectrometry Foundation, the founder of the Thomson Mass Spectrometry Laboratory, and the author of some one thousand scientific papers. Building on his experience in encountering what he sees to be irreducible complexity in a variety of lifeforms and biological components and processes, Eberlin, in *Foresight*, seeks to introduce the concept of divinely-anticipated design. *Foresight* is divided into nine short chapters, each chapter taking a different aspect of biological science as its theme.

In the first chapter, “Foresight in Life,” Eberlin avers that “biology is in the midst of a gold rush of discovery,” arguing that there is an epiphenom-

enon of discovery-about-discovery taking place in many scientific fields. Eberlin has worked in “chemistry, biochemistry, and medical science [...] everything from proteomics, lipidomics, and mass spectrometry imaging to petroleomics and bacteria fingerprinting.” (Eberlin 2019, 13) The insights gained in these areas, Eberlin writes, “taken together, point beyond themselves to something even more extraordinary, [...] a myriad of artful solutions to major engineering challenges [...] This rush of discovery seems to point beyond any purely blind evolutionary process to the workings of an attribute unique to minds—foresight.” (Eberlin 2019, 13–14)

Although Eberlin does not provide a definition of “foresight” apart from this epistemological analogy, the thrust of Eberlin’s main argument become clearer as he introduces scientific findings which he attributes to irreducible complexity—meaning that the components of the specimen in question could presumably not have evolved separately, as the specimen as a whole could not function at any simpler level than what is required for the inter-working functioning of all the parts. Aquaporins, for example—“lipid bilayer membranes” which contain channels capable of balancing H₂O movement through a cell wall at precisely the right volume to maintain delicate cell chemistry balance—are irreducibly complex, Eberlin says, because:

natural selection can only go to work once a viable, self-reproducing cell exists, and it can only progress if each stage in the proposed evolutionary process of construction can somehow be preserved and passed along. Yet nothing gets preserved and passed along if the first proto-cells die a swift death for lack of a fully functioning cell membrane [...] No multi-tasking cell membrane, no life. No life, no gradual evolution by random variation and natural selection. (Eberlin 2019, 21–24)

Like many ID proponents, Eberlin sees this catch-22 cornering of the evolutionary mechanism as evidence of design, and, in turn, design as evidence of foresight. Foresight, finally, is taken to be indicative of creation, and creation of a Creator.

This chain of reasoning undergirds all the other chapters in the book. In Chapter Two, for example, “A World Foreseen for Biochemistry,” Eberlin

foregrounds the fine tuning argument, deploying the famous phrase of (atheist) physicist Fred Hoyle that “a common sense interpretation of the facts suggests that a superintellect has monkeyed with physics, as well as with chemistry and biology, and that there are not blind forces worth speaking about in nature.” (Eberlin 2019, 27)¹ Eberlin applies Hoyle’s remarks to very common substances, such as water and ozone in the atmosphere, to advance the argument that the elements of our world are not only conducive for life, but were put in place, by some “superintellect,” in anticipation of it.

In Chapter Three, “The Code of Life,” Eberlin turns to deoxyribonucleic acid (DNA), the informational currency of life, in continuation of his exploration of foresight in nature. The cell’s “genetic information and [...] information processing system appeared virtually all at once,” Eberlin argues here, “since such things, by their very nature, work in direct synergy and thus cannot evolve bit by bit.” (Eberlin 2019, 45) This chapter is rather technical, covering phosphate anions, ribose, homochirality, genetic redundancy, amino esters, and the intricate workings of the genetic code, all to arrive at another jumping-off point: “The genetic code cannot read itself or implement the instructions it holds,” Eberlin concludes. “To do that, other sophisticated solutions are necessary.” (Eberlin 2019, 62; see also Collins 2006)

These “other sophisticated solutions” are introduced in detail in Chapter Four, “Life’s Helpers,” in which Eberlin explicates the “finely tuned intramolecular ballet” performed by enzymes, proteins which assist in the genetic coding and code-reading required for the operation of a cell (Eberlin 2019, 69). Eberlin focuses on alpha amino acids, particularly intricate substances which must be in perfect balance and proportion—not in a “racemic mixture” of randomly-generated varieties—in order to accommodate the three-dimensional structures of proteins (Eberlin 2019, 65–66). The “quick executions of countless chemical reactions” without which life would be impossible are facilitated by enzymes working on this fine-tuned assembly already in place (Eberlin 2019, 67). “Life is full of problems that must be solved,” Eberlin asserts, and from “chaperone-assisted folding proteins” to the bacterial

¹ Citing Fred Hoyle, “The Universe: Past and Present Reflections,” *Engineering and Science* 45, no. 2 (1981), 8.

flagellum so often relied upon by ID proponents as evidence of design, life is an interlocking arrangement of elegant solutions to problems which, taken separately or, a fortiori, in concert, indicate either “foresight,” as Eberlin argues, or probabilities of coincidental random variations which “beggar rational belief” (Eberlin 2019, 76–77). “Some kind of Darwinian MacGyver,” Eberlin concludes, would be needed “to perform the insane nanomolecular super-tasks” of arranging the parts of molecules to get what nature seems to intend, namely, a functioning element of a cell which works in tandem with a host of other equally-fine-tuned components (Eberlin 2019, 80–81).

Working up from the very small, Eberlin turns in Chapter Five to “Bacteria, Bugs, and Carnivorous Plants,” here showing, for example, how microbes present a “chicken-and-egg paradox,” because plankton, diatoms, autotrophs, hererotrophs, and other microbes “fix” gases in the atmosphere, but these microbes, especially the anammox, are extraordinarily complex and often consume poisons (hydrazine, in the anammox’ case) which present no immediate evolutionary benefit to the organism itself (Eberlin 2019, 83–87). How do these and other organisms, Eberlin wants to know—such as nymphalid planthoppers with gears in their legs (Eberlin 2019, 87–91), tiny peacock mantis shrimp which wield enough punching power to crack glass (Eberlin 2019, 91–94), and carnivorous plants which would have had to evolve “independently at least six times in five angiosperm orders” (Eberlin 2019, 97)²—exist in such intricacy, an intricacy which would have required a long string of coincidences in order to arise randomly? (Eberlin 2019, 98) Eberlin’s answer is, of course, foresight, which our “universal experience” tells us is “a power unique to intelligent agents” (Eberlin 2019, 98).

In Chapter Six, “Birds: A Case Study in Foresight,” Eberlin turns to biology’s interaction with signals science to examine how birds have been able to develop a GPS-like direction and ranging sense which uses the Earth’s magnetic field in order to orient the bird—Eberlin cites the common swift (*Apus apus*)—as she flies around the world. Eberlin draws on recent research

² Citing Aaron M. Ellison and Nicholas J. Gotelli, “Energetics and the Evolution of Carnivorous Plants—Darwin’s ‘Most Wonderful Plants in the World,’” *Journal of Experimental Botany* 60, no. 1 (2009), 19.

to argue that cryptochrome molecules in the swift's eyes allow her "to see lines of the Earth's magnetic field and use them as navigational guides." (Eberlin 2019, 100) These molecules, Eberlin hypothesizes, may make use of quantum entanglement and "radical pair forms in a light-activated Cry4 protein" to help the birds achieve magnetoreception (Eberlin 2019, 101–102). Eberlin quotes physicist Simon Benjamin, who marvels at how the *Apus apus* was able to make use of phenomena known only recently to humans conducting cutting-edge scientific research (Eberlin 2019, 102–103).³

Eberlin discusses birds' eggs in Chapter Six, and then transitions to human eggs and human sperm in Chapter Seven, "Foresight in the Human Form: Reproduction". Here, Eberlin breaks down the process of fertilization step by step, asking how spermatozoa find ova (Eberlin 2019, 109–111), how ova are able to select, from among thousands of varieties, the exact right kind of branching carbohydrate for the zona pellucida covering which spermatozoa must pierce (Eberlin 2019, 111), and then how the fertilized ovum is supported by a "chemical arsenal of pregnancy hormones" (Eberlin 2019, 114) in order to shepherd the growing child to birth, and especially through the last hurdle of cervical dilation (Eberlin 2019, 117–119). Eberlin rounds out this chapter with a celebration of the lowly appendix, arguing that both the human reproductive system and the appendix reveal that design is present even in apparent evolutionary mistakes and that foresight was needed to prepare such a complicated system as the human body for survival and also for giving life to new specimens (Eberlin 2019, 119–121).

In Chapter Eight, "Planning for the Senses," Eberlin continues his search for usefulness in biological elements by arguing that the amygdala, often dismissed as vestigial by evolutionary-minded scientists, is vital for sensing CO₂ and assisting the organism by fostering a useful sense of fear (Eberlin 2019, 134). The human eye is also advanced as an example of irreducible complexity, part of a complex neural network which includes smell—a sense at which moths, Eberlin argues, excel (Eberlin 2019, 123–128). In the conclusion to this chapter Eberlin enters the philosophical, as he

³ Citing Lisa Grossman, "In the Blink of a Bird's Eye, A Model for Quantum Navigation," *Wired*, January 27, 2011 <https://www.wired.com/2011/01/quantum-birds/>.

argues that our senses do not just allow us to survive, but also to live lives that are “beautiful and compelling” (Eberlin 2019, 135). “Careful planning,” carried out long in advance of the advent of human beings, Eberlin argues, was necessary in order to array the human organism to accommodate the various senses (Eberlin 2019, 135).

In his final chapter, Chapter Nine, “Foresight and the Future of Science,” Eberlin recapitulates his arguments and includes a helpful five-step list of evidence for foresight in nature. Eberlin avows that:

there are no *demonstrated* examples of unguided, mindless processes anticipating and solving problems that require a sophisticated orchestration of fine-tuned parts, all brought together on the ground floor of an origin event [...]. Intelligent design [...] represents the best and, indeed, the only causally adequate explanation for the many examples of apparent foresight in the nature world, of situations where problems are ingeniously solved with on-time delivery of multiple, essential, and well-orchestrated parts. The foresight is not merely apparent, but real. (Eberlin 2019, 143)⁴

Eberlin, drawing on the open-ended view of science advanced by Nobel laureate (and founder of mass spectrometry) J.J. Thomson, puts ID in the tradition of “Copernicus, Galileo, Kepler, Newton, Boyle, and many others [who] saw design in the universe and, indeed, were inspired to discover the laws of nature because of their belief in a transcendent law-giver.” (Eberlin 2019, 146–147)⁵ This comports with Eberlin’s definition of science, stated in Chapter Two as:

a systematic and unbiased search for knowledge about nature. Under this definition, we are free to think, investigate, doubt, and conclude based on whatever evidence we have. The underlying principles of science are freedom of thought and speech, guided by data collected using systematic methods. If science—the search for absolute truths hidden within nature—is to be considered an unflinchingly

⁴ Emphasis in original.

⁵ Citing also J.J. Thomson, “Inaugural Address,” The British Association of Winnipeg, *Nature* 81 (August 26, 1909), 257.

truth-directed endeavor, reason and evidence must be the only constraints. (Eberlin 2019, 43)⁶

However, while Eberlin's short book is filled with intriguing examples of design which Eberlin interprets as evidence of "foresight," it may be that his definition of science is keeping him from an even richer view of teleology. American philosopher Edward Feser's latest book, *Aristotle's Revenge: The Metaphysical Foundations of Physical and Biological Science*, stands as a very useful corrective to some of the (ironic) blind spots of ID, ironic because ID proponents such as Eberlin rightly criticize many modern scientists as being irrationally and willfully blind to whither evidence points (Feser 2019). If anything, Feser argues, Intelligent Design theorists (like William Dembski) do not go nearly far enough in insisting on viewing life teleologically. One need not argue for teleology from within the materialist frame set up by the Darwinists, Feser asserts, which is essentially the thrust of ID. *Foresight* fails on this standard because it falls into the narrow lane of merely refuting Darwinism (on Darwinism's on terms), and therefore does not grasp the teleology implicit in science on the Aristotelian understanding. I would add that this holds even more strongly for Thomistic "science," an enormously philosophically robust and subtle approach explicated in great detail by other contemporary philosophers such as Peter Redpath, Fran O'Rourke, and Armand Mauer (Redpath, Crowley 1996; Maurer, Gilson 2008; O'Rourke 2010). From the perspective of the Aristotelians and Thomists, neither the ID theorists nor the Darwinians are nearly scientific enough. A firmer grasp of science as a totality of knowing would go a long way toward overcoming some of the unnecessary dichotomies presupposed by both ID theorists and their Darwinian adversaries alike.

⁶ Citing Gary J. Nabel, "The Coordinates of Truth," *Science* 326, no. 5949 (2009), 53-54. Emphasis in original. "The search for absolute truths hidden within nature" is redolent of the (unprovenanced) quote attributed to Francis Bacon about putting nature on the rack in order to get her to reveal her secrets. See Edward Feser, "Putting Nature on the Rack," March 3, 2016. Accessed May 5, 2020. <https://edwardfeser.blogspot.com/2016/03/putting-nature-on-rack.html>

All in all, though, and despite these theoretical shortcomings, *Foresight* remains a good starting point for anyone looking for a primer on Intelligent Design and the basic challenges it attempts to raise against the dominant scientific paradigm. Marcos Eberlin and his ID colleagues are trying to find a working relationship between faith and reason, even if the results are not taken to as strong a conclusion as Aristotelians or Thomists might wish.

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