

November 2021

**Review of *Return of the God Hypothesis* by Stephen C. Meyer: Part 3**

By Dan Reynolds, PhD

This month we continue the review of Stephen Meyer's new book *Return of the God Hypothesis: Three Scientific Discoveries That Reveal the Mind Behind the Universe*.<sup>1</sup>

**Chapter 10: The Cambrian and Other Information Explosions**

In chapter 10, Meyer extends the information problem to biological evolution. He shows that the Neo-Darwinian mechanism of random genetic mutations acted upon by natural selection is inadequate to account for the necessary genetic sequences associated with biological innovations.

Meyer starts off discussing the Cambrian explosion of the fossil record. The Cambrian explosion occurred over a 5-to-10-million-year period starting about 530 million years ago (MYA).<sup>2</sup> During that time, most phyla appeared suddenly without apparent precursors. Phyla correspond to body plans. Organisms in different phyla vary greatly from one another. It takes genetic information to build an organism. It takes very different information to build another organism with a different body plan. Organisms in different phyla have different body plans, cell types, tissue types, organs, embryological developmental pathways, means of reproduction, etc. So, any theory that explains the Cambrian explosion must explain the information explosion it represents. From where or by what process did all the genetic information necessary to build vastly different organisms arise in a relatively short period of time?

Meyer says that there have been other similar biological explosions during the history of life. These include the angiosperm "big bloom" during the Cretaceous (130

MYA) and the mammalian radiation in the Eocene (about 55 MYA).<sup>3</sup> The fossil record is characterized by sudden appearance, stasis, extinction, and a lack of transitional forms connecting major radiations. The pattern observed in the fossil record was not predicted nor explained by Darwin.

Meyer explains that proteins are central to biological structures and function. Whatever explanation there is for the "explosions" of life, it must explain the emergence of novel proteins. Proteins are polymers of amino acids. There are 20 essential amino acids that compose most proteins. The sequence of amino acids in the protein determines its three-dimensional structure, and its three-dimensional structure determines its function. Meyer says that protein folds are the basic structural component present in biologically relevant proteins.<sup>4</sup> So, the question is how rare are the amino acid sequences that promote protein folds? In other words, out of all the possible sequences of a given number of amino acids, what fraction have protein folds. Experiments have shown that for every sequence of 150 amino acids that produces a protein fold, there are  $10^{77}$  of such sequences that do not. Meyer shows that even under the most favorable chemical conditions, a random search of the sequence space corresponding to proteins with 150 amino acids would not likely find a single sequence that would produce a protein fold *during the last four billion years*.

The rarity of useful amino acid sequences also has implications for the Cambrian explosion and macroevolution in general. Indeed, because of their rarity, useful amino acid sequences are isolated from one another; one useful sequence cannot be converted into another useful sequence by random mutations without

<sup>1</sup> For Part 1 see: <[https://tasc-creationscience.org/sites/default/files/2021-09/sept2021\\_0.pdf](https://tasc-creationscience.org/sites/default/files/2021-09/sept2021_0.pdf)>. For Part 2 see: <<https://www.tasc-creationscience.org/sites/default/files/2021-09/oct2021.pdf>>.

<sup>2</sup> These ages are mentioned because Meyer subscribes to them. The dates were determined by conventional

secular dating methods and assumptions and do not represent the position of TASC on this issue.

<sup>3</sup> Meyer SC (2021) *Return of the God Hypothesis: Three Scientific Discoveries That Reveal the Mind Behind the Universe*, Harper One, New York, NY, 191

<sup>4</sup> Meyer is being generous is assuming every protein fold will result in a biologically useful protein.

first generating meaningless/useless intermediate sequences. From an evolutionary point of view, this means that evolving new proteins from preexisting proteins would involve intermediate amino acid sequences that had no function. But useless/functionless amino acid sequences would be eliminated by natural selection; the new useful protein would never be realized. In other words, mutating proteins would lose biological relevance long before stumbling upon a new use useful protein. Therefore, the mutation selection mechanism cannot evolve new proteins with new functions, nor can it, then, account for macroevolution or the Cambrian explosion. Clearly, the random mutation/natural selection mechanism of Neo-Darwinism is causally inadequate to explain the generation of novel information during the Cambrian explosion. Meyer briefly summarizes the causal adequacy of other more recently proposed evolutionary mechanisms:

Indeed, invariably either these new theories of evolution do not explain the origin of necessary and ontogenetic information or they simply presuppose unexplained, preexisting sources of such information.<sup>5</sup>

Meyer then explains what would be required of a causally adequate explanation for the information seen in biology. Random mutations, the only unguided natural process available to generate novel amino acid sequences, is not up to the task. Meyer says:

What is needed is not just a source of variation or a mode of selection that can operate after the fact of a successful search, but instead a means of selection that (a) operates during the search—before success—and that (b) is guided by information about or knowledge of a functional target.<sup>6</sup>

In other words, the mechanism must have *foresight*. But natural processes don't have foresight, only intelligent agents do. Meyer says that the only known cause of the type of information observed in living things is intelligence.

### **Part 3: Inference to the Best Metaphysical Explanation**

#### **Chapter 11: How to Assess a Metaphysical Hypothesis**

In chapter 11, Meyer lays down the philosophical groundwork for how one could determine which theory

of reality, naturalism or the God hypothesis, is correct. He explains how cosmic and biological origins are explored by the *historical sciences*<sup>7</sup> rather than operational science in the here and now. The historical sciences seek to explain how the present world came into being. We cannot go back into the past to witness those events. However, we can observe what happens in the world now, and based on this background knowledge we can make inferences to what causes may have brought the world to its present state.

Meyer distinguishes between deductive and *abductive* reasoning; the latter is used by the historical sciences. Deductive reasoning works as follows.

- Logic: If an event or condition A occurs, event B follows.
- Data: A is observed.
- Conclusion: B must necessarily follow.

For example, when it rains (A), things get wet (B). If it's raining, things *must* be getting wet.

Notice that B *always* follows A, so that if we observe A, we can be *certain* that B will also take place. However, if all we know is that B is true, we cannot with certainty say A caused B. To do so would be to commit a logical fallacy known as *affirming the consequent*. The reason we can't infer A upon observing B with certainty is that there may be other causes for B. Just because something is wet does not necessarily mean it has rained, although that is a possibility.

Abductive reasoning works as follows:

- Logic: If an event or condition A occurs, event B follows.
- Data: B is observed.
- Conclusion: A *may* have caused B.

Abductive reasoning is similar to confirming the consequent with the important difference that abductive reasoning makes inferences that are considered *plausible* but not necessarily *certain*. Meyer will develop his

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<sup>5</sup> Meyer SC (2021)p.209. For a detailed discussion of the various current evolutionary theories and how they fail to account for biological information, see Meyer SC (2013) *Darwin's Doubt*, Harper One, New York, NY, especially chapters 15 and 16.

<sup>6</sup> Meyer SC (2021) 211

<sup>7</sup> Examples of historical sciences are geology, archeology, evolutionary theory, cosmology, etc. Abductive reasoning is also used by forensic detectives to solve crimes.

argument for the God hypothesis using abductive reasoning.<sup>8</sup>

Meyer discusses the possibilities for explaining origins. Either there is a God or there isn't. If there is no God, materialism must be correct. If there is a God, that God is either personal or impersonal. If God is impersonal, then pantheism is correct. Pantheism considers God to be a part of nature and indistinct from it. If God is personal, then He either superintends His creation in real time or He does not. If God does not superintend His creation in real time, then deism is correct. Deism holds that God created the universe and physical law, established the initial conditions, but then allowed the creation to evolve to its present state autonomously. If God does superintend His creation in real time, then theism is correct. Theism holds that God created the universe and physical law, established the initial conditions, and guides outcomes in real time.

These four possibilities—materialism, pantheism, deism, and theism—are the alternative metaphysical views that we must choose from. Meyer says we can use abductive reasoning to sort out which of the four competing views is most likely to be right. Meyer says that whatever caused the universe must have *causal adequacy* to explain the data. We should also ask which of the competing hypotheses has the greatest *explanatory power*.

Meyer will seek to answer which of the four competing hypotheses is most likely to be true in light of the following facts: (1) the universe had a beginning, (2) physics is fine-tuned for life, (3) abiogenesis is not explained by our current knowledge of chemistry, (4) macromolecules contain information, (5) the Cambrian explosion was an information explosion, etc.

## Chapter 12: The God Hypothesis and the Beginning of the Universe

In chapter 12, Meyer takes a closer look at the implications of a universe that has a beginning. Meyer says that a universe that begins to exist provides “epistemic support” for the God hypothesis. That is, assuming theism, one might expect that the universe began to exist a finite time ago. God as creator would start His creation. On the other hand, assuming materialism, one would not expect that the universe began to exist but instead had always existed.

A universe that begins to exist poses a real difficulty for the materialist. Materialists believe everything can be explained by chemistry and physics operating in space

and time. But recall that an expanding universe implies an initial singularity which has no space, matter, energy, or time. A singularity has no space to put matter and energy into. A singularity is nothing, or at least nothing with space, time, matter, or energy. So, if there is no space, time, matter, or energy, what remains to start a universe? Therefore, naturalism is not causally adequate to explain the origin of a universe that is finite in time (had a beginning). Meyer says that pantheism also lacks causal adequacy to account for a universe that has a beginning because its god is intimately associated and identified with the material universe and does not exist independently from it. Hence, the pantheistic god would also begin to exist and would likewise require an explanation. Hence the cause of a universe that begins to exist “must transcend the space and time, matter and energy of the universe.”

Meyer explains that some scientists believe the universe sprang from a “primeval atom” that had existed eternally. This primeval atom would not have been a singularity but would have consisted of matter and energy confined to an extremely small, but nevertheless real, volume. Meyer says this idea has problems. If the primeval atom had existed eternally, then it or its precursors must have always had the potential to evolve into our universe. But if that is the case, why did the primeval atom not evolve into our universe an infinitely long time ago? What material cause could have operated on the primeval atom to commence its evolution into our universe when all matter and energy would have been in the primeval atom in a “timeless, changeless state”?<sup>9</sup> Such a primeval atom would be best described by a quantum theory of gravity. Can what we know about quantum mechanics shed any light here? Meyer quotes physicists Anthony Aguirre and John Kehayias to explain:

[I]t is very difficult to devise a system—especially a quantum one—that does nothing “forever,” then evolves. A truly stationary or periodic quantum state, which would last forever, would never evolve, whereas one with any instability will not endure for an indefinite time.<sup>10</sup>

In other words, an eternal primeval atom that suddenly begins to evolve into a universe has no precedent in known quantum physics. However, theism poses a personal God with free will who could decide to create a universe out of nothing. Meyer states, “The concept of free will, also called libertarian agency, entails the idea that an agent with such freedom of will can initiate a new chain of

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<sup>8</sup> Meyer also frames the use of abductive reasoning in the language of Bayesian analysis. The reader is referred to pages 231–235 of the book for more details.

<sup>9</sup> Meyer SC (2021) 252

<sup>10</sup> Aguirre A, Kehayias J (2013) Quantum instability and the emergent universe. *Phys. Rev. D* 88: 103504

cause and effect without being compelled by any prior material conditions.”<sup>11</sup> A universe which begins to exist is more consistent with theism than naturalism.

### Chapter 13: The God Hypothesis and the Design of the Universe

In chapter 13, Meyer argues that the fine tuning of the laws and constants of physics and the low entropy of the initial conditions of the universe are better explained by theism or deism than by naturalism or pantheism. Since the fine tuning of physical law and the initial conditions had to exist from the very beginning of the universe, the cause of this fine tuning must have existed prior to and outside of the universe. Hence panspermia, the idea that an advanced race of beings seeded the earth with life, can't explain how the first life evolved. Nor can it explain the fine tuning of physics and the initial conditions since panspermia relies on an intelligence that would have taken much time to evolve and could not have been present initially. The known laws of physics have constants that, as far as we know, are contingent and could have had a wide range of values, but just happen to have the precise values necessary for life. Why? Similarly, the initial configuration of matter and energy would not have been expected to have had its low entropy (which it must have had to explain our universe) based on quantum mechanics.

Meyer says that the laws of nature cannot explain themselves. He considers the possibility of a theory of everything from which all physical laws and constants could be derived. But then, how do we explain the origin of a finely tuned theory of everything? The laws of physics can explain the behavior of the universe but not its origin.<sup>12</sup> The laws of physics can't explain the origin of the laws of physics. The laws of physics did not determine the initial configuration of the matter and energy of the universe since, from a materialistic point of view, that would have been determined by chance (quantum indeterminacy). The laws can show, however, how the universe would unfold given a set of initial conditions. So, even with a theory of everything, the finely tuned initial conditions would still have to be explained. Meyer reserves discussion of the *multiverse hypothesis* for chapter 16.

Pantheism believes in a god that is one with and part of nature. Hence, the pantheistic god would have begun to exist along with the universe and cannot therefore explain the fine tuning of physics that was in effect at the

beginning. Something or someone prior to the beginning is required.

Meyer concludes the chapter by considering the casual adequacy of theism and deism for explaining the origin of the universe and the fine tuning of physics. God, as conceived by theism and deism, would have existed prior to the universe; would have had the foresight and intelligence to plan the structure of space, time, matter, energy, physical law, and the initial conditions necessary for life; and would have been able to decide how and when to bring the universe into existence. Hence, God, as conceived by theism and deism, is casually adequate (has the “right skill set”) to explain the origin of the creation of the universe from nothing, the fine tuning of physics for life, and the fine tuning of the initial configuration of the matter and energy in the universe.

### Chapter 14: The God Hypothesis and the Design of Life

In chapter 14, Meyer explains why theism is a better metaphysical explanation for the universe than deism.

Meyer defines various philosophical positions. *Theistic evolution* is the belief that God created the universe, enacted finely tuned physical laws, and set up the initial configuration of matter and energy but then allowed the universe to unfold and life to evolve without divine intervention. Theistic evolutionists believe that God provided the information to build the first cell into the laws of physics and the initial conditions of the universe and that the random mutation/natural selection process was adequate to produce all subsequent life forms. Meyer calls this initial infusion of biological information “front loading.” Meyer says that theistic evolution differs from deism in that the former acknowledges that God “actively sustains the orderly concourse of nature—the laws of nature—on a moment by moment basis” while deism denies any divine activity after the creation. Theism is the belief that God created the universe, enacted finely tuned physical laws, set up the initial configuration of matter and energy, guided the unfolding of the universe, and then occasionally infused information into the earth's biosphere (origin of life, Cambrian explosion, major radiations, etc.).

Meyer argues that life would not exist in a deistic universe. His arguments are based on what we know about physical laws, biochemistry, and information. The information in DNA, RNA, and proteins, just as in a written text, is encoded in the sequences of chemical units that act like letters in an alphabet. Those sequences are

exist apart from nature. Indeed, the laws of physics are part of nature. These laws are part of what needs to be explained when we consider the origin of the universe.

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<sup>11</sup> Meyer SC (2021) 253

<sup>12</sup> After all, the laws of physics are merely *descriptions* of what we observe in nature and, as far as we know, don't

aperiodic and do not follow regular, repetitive, or predictable patterns. In contrast, physical laws typically produce regular, repetitive, and predictable patterns. Examples of processes in nature that occur spontaneously and increase the order of systems include crystallization and vortices (tornados and hurricanes). These naturally occurring processes do bring order to a system, but not complex information. The structure of a crystal lattice is extremely repetitive, and the vortex of a tornado can be described by simple algebraic equations. Some evolutionists believe we will eventually find physical laws that explains abiogenesis, but the problem of explaining the aperiodic nature of the information in biomolecules would remain. Meyer says there can't be any physical law that could explain abiogenesis since physical laws would only produce repetitive and simple sequences and arrangements.

As already discussed in chapter 9, the monomers that make up DNA, RNA, and proteins have no particular chemical preference for one monomer over another. Hence using chemistry alone to join these monomers into polymers would simply form random sequences, and experiments have shown that only a very tiny fraction of all possible sequences has any biochemical relevance. A random search for biologically meaningful sequences would require more time than the presumed age of the universe (13.8 billion years). So, chemistry alone would be unable to produce the information needed to construct a cell.

Concerning information, Meyer explains why abiogenesis would fail in a deistic universe even if the information needed to build a cell was somehow encoded into the universe's initial configuration of matter and energy accompanied by finely tuned physical laws. Deists must believe that the original information encoded into the initial configuration of matter and energy was somehow faithfully transmitted for billions of years through the formation of the elements, the formation of stars, supernovae, three complete generations of stars, the formation of a planetary nebula, asteroid bombardments, formation of the moon, plate tectonics, the formation of the oceans, etc. Meyer says we know that the transmission of information is usually accompanied by degradation of the information. This is a direct result of the second law of thermodynamics. In addition, the early universe would have been very hot, a condition where particles would move rapidly and any information encoded in the initial arrangement would have rapidly dissipated. Meyer says

that quantum indeterminacy would also have wreaked havoc with the positions and velocities of the elementary particles early on, adding to the degradation.

So, given what we know about physical laws and the behavior of matter and energy, any information present in the initial conditions at the moment the universe began would have dissipated long before the formation of the earth (according to secular theories). Therefore, deism and theistic evolution do not have causal adequacy to explain the information in biochemistry. However, theism holds that God not only created and set up the universe but actively superintends it as well. Hence God would have supernaturally intervened in history to provide the information required for abiogenesis, the Cambrian explosion, and the creation of humans.

## **Part IV: Conjectures and Refutations**

### **Chapter 15: The Information Shell Game**

In chapter 15, Meyer discusses the RNA World hypothesis, the Cambrian explosion, the origin of new proteins, and the role chance plays in the Darwinian mechanism. He discusses these topics in his responses to critics of his first two books.<sup>13</sup>

As previously explained in the discussion of chapter 9,<sup>14</sup> the RNA World hypothesis claims the first self-replicating chemical system may have been a ribozyme, an RNA molecule that served as both information carrier and chemical catalyst. Meyer says that the RNA World hypothesis presupposes biological information but does not explain its origin. So far, no one has demonstrated how the four nucleotides (adenine, cytosine, guanine, and uracil) which make up RNA might have arisen in high concentration under realistic geochemical conditions. Indeed, so far experiments have been only partially successful in preparing two of the four nucleotides, the pyrimidines: cytosine and uracil. They were only partially successful because the investigators had to intervene by selecting only those molecules with the right three-dimensional structures, by purifying the reaction products after each step to prevent cross reactions, and by following a step-by-step process. In other words, the investigators had infused information into the system in order to obtain the desired products. Of course, raw chemistry would not have provided any of these controlled conditions or procedures. The investigators had unwittingly demonstrated that intelligence is required to produce adenine and cytosine in appreciable quantities.

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<sup>13</sup> Meyer's first two books were *Signature in the Cell* and *Darwin's Doubt*.

<sup>14</sup> Reynolds D (2021) Review of Return of the God Hypothesis by Stephen C. Meyer: Part 2. <[https://tasc-](https://tasc-creationscience.org/sites/default/files/2021-09/oct2021.pdf)

[creationscience.org/sites/default/files/2021-09/oct2021.pdf](https://tasc-creationscience.org/sites/default/files/2021-09/oct2021.pdf)> Accessed 2021 Oct 08.

Other investigators have created self-replicating RNA based systems. However, these investigators have not shown how their well-designed systems could have arisen by chemistry alone. One such system involved four artificially produced RNA monomers and two RNA ribozymes. The system could replicate itself. One of the ribozymes could produce the other ribozyme by making a single bond between two of the RNA monomers. The new ribozyme could then make the first ribozyme by combining the remaining two RNA monomers. While creative and interesting, these experiments did nothing to explain the origin of the sequence information required to produce the monomers and ribozymes. Again, the investigators had unintentionally shown that production of such systems requires intelligence.

Meyer reviews one critical response he received to one of the main theses of his book *Darwin's Doubt*. Meyer said that the Cambrian explosion in the fossil record must have involved the production of much new biological information in order to explain the new body plans, new cell types, new tissue types, new developmental genetic regulatory networks (dGRNs), etc. One critic claimed that there were essentially no new genes generated during the Cambrian explosion but only a "rewiring" of the expression of the existing genes during embryological development. Meyer countered that from what we know of dGRNs: even slight changes result in deformity or death, not innovation or adaptation. Further, Meyer points out that changing the expression of genes during development, changing dGRNs, would *require* an infusion of new information, contrary to his critic. His critic did not explain the origin of the original genes and dGRNs. Meyer also says that new organisms would require new proteins which require new genetic information which would require new genes.

Another critic claimed the amino acids sequences that could form protein folds were not rare after all, implying a random search could easily find other biologically relevant amino acid sequences (proteins). The criticism was based on a study where proteins were mutated randomly to see how often the mutants would form "stable three-dimensional structures." But the study could not distinguish between "folded functional proteins" and "aggregations of amino acids," so the results did not help answer the question of the rarity of useful amino acid sequences. Meyer then cited four other investigations that underscored the extreme rarity of useful amino acid sequences.

Another critic said that the enzyme "nylonase," an enzyme that can digest synthetic nylons, was generated (evolved) by a single frameshift mutation of a functional protein.<sup>15</sup> If so, that would seem to suggest that useful amino acid sequences must not be as rare as Meyer claimed. However, Meyer found that investigators most familiar with the 392-amino acid nylonase believed, based on experiments, it arose from two point mutations of a preexisting protein that already had weak nylonase activity. While the random generation and accumulation of two specific point mutations is unlikely, it is not unprecedented. To back their claim, the investigators started with a 392-amino acid enzyme that had weak nylonase activity and converted it into an enzyme with greater nylonase activity with just two point mutations. The original and mutated proteins had the same three-dimensional structures demonstrating no new protein folds had been generated. Meyer concluded that his claim that "the mechanism of random mutation and natural selection can optimize (or even shift) the function of a protein, provided it does not have to generate a new fold," had been vindicated.

Finally, some atheistic evolutionists have claimed that Meyer mischaracterizes the Darwinian mechanism—they insist that natural selection is not a random process. However, Meyer rightly points out that natural selection can't operate until a functional gene exists, and the process that generates the functional gene is random. Hence, consideration of statistical probabilities of forming specific nucleotide sequences is a realistic way to assess whether a gene could form by unguided chemistry or not. ❧

Part 4 of this review of Meyer's book will be published on the TASC website in December.

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<sup>15</sup> The genetic text in DNA is read three nucleotides at a time. Each three nucleotides comprises a "codon" which is ultimately translated into a specific amino acid in the ribosomes. A frame shift mutation causes the starting

place (nucleotide) from where the DNA is read to shift to another location (nucleotide) thereby changing all the codons in the DNA sequence.



## COMING EVENTS

TASC Zoom Meeting, Thursday, November 11, 7:00 pm EST

Special guest speaker: Rob Stadler

TASC is honored to have Dr. Stadler come speak to us!



Rob Stadler, PhD

More than 150 years of continuous debate about evolution has involved many forms of evidence. However, different forms of evidence provide different levels of confidence, and the evidence that provides high confidence should be prioritized over evidence that only provides low confidence. Dr. Stadler will describe the differences between high-confidence and low-confidence evidence and will explain how

proper prioritization of evidence provides a profound new view of evolution—one that they did not teach you in biology.

Rob Stadler is a scientist and a committed Christian. By God's grace, he earned a PhD in medical engineering from Harvard and MIT, has obtained more than 150 US patents, and contributed to a variety of cardiac devices that have been implanted in millions of patients. Dr. Stadler is passionate about resolving the apparent conflict between science and faith, a topic that he addresses in his first book, *The Scientific Approach to Evolution* and in his recent co-authored book, *The Stairway to Life*. In a society where science is increasingly portrayed as the ultimate authority that contradicts God's word, this message is urgently needed.

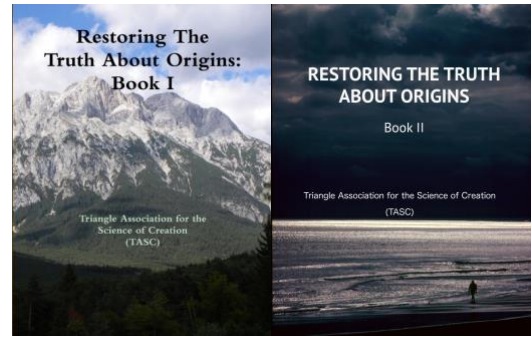
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