

14 A MORE ON FINE TUNING AND DESIGN

Introduction

The concept of evidence for specialized design of the universe arose in the latter part of the twentieth century and encompasses several areas:

- The Anthropic Principle
- Our “improbable planet”
- Fine-tuning examples
- Our “privileged planet”
- Organized complexity

The Anthropic Principle

The “Anthropic Principle” was first proposed in 1957 by physicist Robert Dicke as an explanation for the fine-tuning he noticed in the physical world. Brandon Carter expanded on the idea in 1973 and distinguished between a “weak” form and a “strong” form. The Anthropic Principle states that “the universe is precisely tuned to enable the emergence of intelligent life.” [1] The Weak Anthropic Principle suggests that intelligent life is necessary to measure physical constants and observe the universe. We observe the universe in its present form because it allows for our existence. The Strong Anthropic Principle states that the universe is “compelled” or “required” to support human life. Somehow humanity seems to be the “central theme” of the cosmos. John Barrow and Frank Tipler devoted a book to the concept [2], questioning whether the appearance of design is simply an appearance and exploring the “many worlds” interpretation of quantum mechanics.

The fine-tuned constants and human studies of the universe seem best explained by a creator God. [3]

Inevitable or Improbable Life?

Current observations indicate that the universe is not “teeming with life,” as once thought possible.

A few scientists speak as though life somewhere else in the universe is inevitable, that given enough time the galaxies will be teeming with life. The fact is, however, that we have no evidence of life developed beyond earth and instead find that the number of candidate planets for the possibility of life is increasingly small. [4]

A current theme among some in science is that there is actually “nothing special” about the earth. [5] That human life should exist as the dominant form of life on earth is considered a lucky accident. Hugh Ross, however, in *Improbable Planet*, details the essential conditions for life that exist on and near the earth and which are extremely rare in the rest of the universe. [6]:

1. Just-right mass density –to produce the elements essential for life and the right rate of burning for stars
2. Just –right age – to allow critical radioisotopes to form
3. Just right neighborhood – in a galaxy with symmetrical spiral arms for sufficient stability and holding of gases
4. Just –right “habitable zone,” containing:
 - Liquid water
 - Right amount of ultraviolet radiation
 - Right conditions for photosynthesis
 - Right ozone shield
 - Right rotation rate and cloud formation
 - Right tilt for temperature range
 - Right tidal forces
 - Right magnetic field

“Intelligent Design”

Intelligent Design is the concept that so much of the universe seems “fine-tuned” for life that it suggests a deliberate, rational (“intelligent”) Designer, as opposed to random development of the cosmos (although basic I.D. gives no details about this Designer). Opponents argue that I.D. is an attempt to “smuggle” religion into science, but proponents argue that those opposing discussion of I.D. are biased against anything besides random origins.

Privileged Planet, by Richards and Gonzalez, [7] makes the case that not only is the earth ideally suited for life, but it is also ideally situated in the galaxy to make it possible to observe and study the rest of the universe.

Fine Tuning Examples

Chong presents several examples of “fine -tuning”: [8]

Stephen Hawking: if the rate of the universe's expansion one second after the Big Bang had been smaller by even one part in 10¹⁵, the universe would have re-collapsed.

P.C.W. Davies: The odds against the initial conditions being suitable for star formation is at least 10¹⁰²¹.

P.C.W. Davies: A change in the strength of gravity or the weak force by one part in 10¹⁰⁰ would have prevented a life-permitting universe.

Roger Penrose: Odds of the Big Bang's low entropy condition existing by chance are on the order of one out of 10¹²³⁰.

There are around 50 such quantities and constants present in the Big Bang that must be fine-tuned in this way if the universe is to permit life. Not just must each quantity be fine-tuned, their ratios must also be fine-tuned.

Former NASA engineer Leslie Wickham adds:

Earth's temperature is not too hot, not too cold, but rather just right so that water (the perfect solvent) can exist in all three physical phases, allowing for the life-giving water cycle. Earth's mass is not too big, not too small, giving us just the right gravity to be strong enough to hold onto life-giving water vapor (weighing 18 grams per mole), but not strong enough to hold onto large amounts of the slightly lighter poisonous gases, methane (at 16 grams per mole) and ammonia (at 17 grams per mole)... Water... has the unusual characteristic of becoming less dense when it freezes (unlike pretty much every other substance), so water ice floats on top of liquid water, providing an insulating blanket over the top of the water below. [9]

Martin Rees (Just Six Numbers) [10] documents six constants in place that he shows are essential for life to exist:

1. Number of spatial dimensions (3)
2. Ratio of electronic to gravitational force
3. Hydrogen to helium conversion fraction
4. Average matter density in the universe
5. Average dark energy in the universe
6. How tightly bound the galaxy clusters are

Robin Collins [11] presents a detailed case for the fine-tuning of the universe (specifically for life) and how this suggests (but does not prove) a divine Creator. Collins looks at three areas of fine tuning: (1) The fine-tuning of the laws of nature, (2) The fine-tuning of the constants of nature, and (3) The fine-tuning of the initial conditions of the universe. [12]

...We shall consider the following five laws or principles (or causal powers) and show that if any one of them did not exist, self-reproducing, highly-complex material systems could not exist: (1) a universal attractive force, such as gravity; (2) a force relevantly similar to that of the strong nuclear force, which binds protons and neutrons together in the nucleus; (3) a force relevantly similar to that of the electromagnetic force; (4) Bohr's Quantization Rule or something similar; (5) the Pauli-exclusion principle. [13]

...Examples of fine-tuning of the constants [of nature] are: if the mass of the neutron were slightly increased by about one part in seven hundred, stable hydrogen burning stars would cease to exist ; if the weak force were slightly weaker by one part in 10⁹ of the range of force strengths, then the existence of complex life would be severely inhibited. [14]

Other constants critical for earth physics and for life include the gravitational force and the cosmological constant.

Initial conditions of the universe include the mass-energy distribution and the initial extremely low entropy state. [15]

Designed to the Core

In *Designed to the Core* [16], astrophysicist Hugh Ross makes the case that every tiny detail in the universe is part of God's grand design.

*There are two ways to look at the universe. In one, the expanse is enormous and there are billions of stars and planetary objects. Earth is a tiny blob, yet with conscious life. In the other, the rest of the universe helps make possible the conditions for life to exist on earth. This is the approach of Hugh Ross' *Designed to the Core*.*

Astrophysicist Neil deGrasse Tyson once declared, "The universe is a deadly place. At every opportunity, it is trying to kill us." Tyson is not alone in his dark, doomsday perspective. Many have sought to warn of the weapons the universe might use to wipe out humanity. Similar to the tone of Tyson is the media minefield we now refer to as "climate change"—but is it a political issue or a real threat to our planet?

In this fascinating midweek podcast episode, Frank is joined by the legendary Hugh Ross. Their discussion takes listeners on a journey from deep inside the Earth's core all the way to the moons of Mars with multiple stops in between! [17]

Organized Complexity

"Organized complexity" is the concept that a set of objects can exist involving many variables such that there is no simple solution to the resulting system of equations.

William Dembski writes-

Nature exhibits complex organized structures that cannot be reduced to their constituent parts. Over the last twenty years two approaches have emerged to account for these structures: intelligent design and complex self-organization. Although neither of these approaches is reductionist, prima facie their understanding of organized complexity is very different. Intelligent design looks to engineering and design principles to account for organized complexity and typically invokes a guiding intelligence. Complex self-organization, on the other hand, looks to emergent properties of physical systems to understand organized complexity. Both approaches connect to the Christian doctrine of creation in ways that are at once congruent and disturbing. Design places front and center the wisdom of God in creation but seems to allow for almost magical intrusions into the natural order that threatens to undo its integrity. Self-organization, on the other hand, places a premium on preserving the integrity of creation, but seemingly leaves no evidence of the divine handiwork. [18]

Ideally, we can find an approach that “pays due both to the divine wisdom in creation and to the integrity of the world as an act of creation.”

Stephen Meyer follows up-

*Indeed, as William Dembski has recently demonstrated, we often infer the causal activity of intelligent agents as the best explanation for events and phenomena. Moreover, we do so rationally, according to objectifiable, if often tacit, information and complexity theoretic criteria. His groundbreaking new book *The Design Inference*, published by Cambridge University Press, gives a formal theoretical account of the criteria by which specialists in many fields reliably detect intelligent causes. Dembski shows that whenever events are both highly improbable and specified, we infer intelligent design (not chance, law, or some combination of the two) as the best causal explanation for the event or artifact in question. Thus he shows that design inferences are based upon the presence of particular features implying an intelligent cause, not (solely) upon the absence of evidence for the efficacy of natural causes...*

Since the elucidation of the DNA structure by Watson and Crick in 1953, it has become clear that the coding regions of DNA possess the same property of sequence specificity, or specified complexity, or information content that written codes or languages do. Just as the specific arrangement, not the chemical properties, of the letters in this article account for the communication function that it performs, so too does the specific sequencing of the nucleotide bases in DNA account for the function that DNA performs within the cell. In particular, the specifically sequenced nucleotide bases on the DNA direct the process of protein synthesis in the cell...

For those who want to explain the origin of life as the result of self-organizing properties or natural laws intrinsic to the material constituents of living systems, these rather elementary facts of molecular biology have devastating implications. The most logical place to look for self-organizing chemical laws and properties to explain the origin of genetic information is in the constituent parts of the molecules carrying that information. But biochemistry and molecular biology make clear that law-like forces of attraction between the constituents in DNA (as well as RNA and protein) do not explain the sequence specificity of these large information-bearing biomolecules. [19]

CSI (Dembski)

William Dembski has proposed a measure for design he terms CSI –complex specified information. A pattern exhibits specified complexity, according to Demski, if it is highly improbable and has a structure that can be specified.

This argument for showing that CSI is a reliable indicator of design may now be summarized as follows: CSI is a reliable indicator of design because its recognition coincides with how we recognize intelligent causation generally. In general, to recognize intelligent causation we must establish that one from a range of competing possibilities was actualized, determine which possibilities were excluded, and then specify the possibility that was actualized. What’s more, the competing possibilities that were excluded must be live possibilities, sufficiently numerous so

that specifying the possibility that was actualized cannot be attributed to chance. In terms of probability, this means that the possibility that was specified is highly improbable. In terms of complexity, this means that the possibility that was specified is highly complex. All the elements in the general scheme for recognizing intelligent causation (i.e., Actualization-Exclusion-Specification) find their counterpart in complex specified information—CSI. CSI pinpoints what we need to be looking for when we detect design...

Natural causes are therefore incapable of generating CSI. This broad conclusion I call the Law of Conservation of Information, or LCI for short. LCI has profound implications for science. Among its corollaries are the following: (1) The CSI in a closed system of natural causes remains constant or decreases. (2) CSI cannot be generated spontaneously, originate endogenously, or organize itself (as these terms are used in origins-of-life research). (3) The CSI in a closed system of natural causes either has been in the system eternally or was at some point added exogenously (implying that the system though now closed was not always closed). (4) In particular, any closed system of natural causes that is also of finite duration received whatever CSI it contains before it became a closed system. [20]

Animal Algorithms

In *Animal Algorithms* [21], Eric Caswell details the amazing mechanisms present in numerous animals allowing them to act and navigate in ways that approximate our best scientific equipment (GPS, gyros...).

How do some birds, turtles, and insects possess navigational abilities that rival the best manmade navigational technologies? Who or what taught the honey bee its dance, or its hive mates how to read the complex message of the dance? How do blind mound-building termites master passive heating and cooling strategies that dazzle skilled human architects? [22]

In our ordinary experience, when random changes are made to a computer algorithm, it inevitably degrades function rather than enhancing it. Digging deeper, they discuss the No Free Lunch theorems of William Macready and David Wolpert, and the problem of blind searches for everything from Rubik's cube solutions to the formula for WD-40. Another challenge facing attempts to explain complex programmed behaviors in evolutionary terms: There are cases where only extremely distantly related insects share certain complex instinctive behavioral strategies. This is the problem of convergence, and Cassell explains why in these cases it doesn't work to appeal to engineering constraints as an explanation. Cassell says there's a better explanation than mindless evolution but he suspects that many are blocked from considering it by what he terms "teleophobia." [23]

Wonder of the World

Roy Abraham Varghese in *The Wonder of the World* [24] makes these observations from science:

We can model hundreds of natural processes (giving rise to all of physics) using mathematics. (p. 329)

“(Paul) Davies concludes that the natural world isn’t just a concoction of entities and forces but an ingenious and useful mathematical scheme.” [25]

While the subatomic world is characterized by randomness, the physical world at our scale is predictable. “Despite the intrinsically unpredictable nature of the basic building blocks of the world, everything surprisingly settles down into orderly, precise structures at the level of the macroverse..The difference between classical and quantum physics simply mirrors the radical difference between the micro and the macro worlds.” [26]

We don’t know how energy originated or how empty space could have energy associated with it. (p. 403)

We can’t explain the origin of electromagnetic radiation. “If we think that cell phones, radar guns, and radio transmitters are works of genius, let’s not forget that we’re simply hitching rides on the freely available electromagnetic spectrum.” [27]

DNA contains information, and information implies intelligence. “In *The Advent of the Algorithm*, David Berlinski has shown that each molecule of DNA is embodied intelligence because it contains information in a set of signs that have their own meaning...The algorithm transfers information between two sets of symbols, proteins and nucleic acids...” [28]

Summary

Abraham concludes: “Reality as a whole is rational and can be understood, categorized, and connected using rational principles...Not only can the world be known, we can know it...” [29] A mysterious correspondence exists between our minds and the external world.

The best explanation for both the fine-tuning and the rational aspects of the universe? “The source of all the intelligence in the world is Infinite Intelligence, or God” [who is both infinite and personal]. [30]

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