THE BIG BANG THEORY AND THE ORIGIN OF LIFE

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Every major society from every age in history has had its own story about its origins. For instance, the Eskimos attributed their existence to a raven. The ancient Germanic peoples of Scandinavia believed their creator—Ymir—emerged from ice and fire, was nourished by a cow, and ultimately gave rise to the human race.

Those are just two examples. But no matter the details, these origin stories always endeavor to answer people's innate questions: Where did we come from? What is our destiny? What is our purpose?

Two widely held theories in today's world are abiogenesis and the Genesis story. The first states that life emerged through nature without any divine guidance; the second involves a supernatural Creator.

Abiogenesis

Abiogenesis is sometimes called "chemical evolution" because it seeks to explain how non-living ("*a*bio") substances gave rise to life ("genesis").

TWO WIDELY HELD THEORIES IN TODAY'S WORLD ARE ABIOGENESIS AND THE GENESIS STORY.

Abiogenesis was added to the list of origin stories over one hundred years ago when Charles Darwin first speculated that life could have begun in a "warm little pond, with all sorts of ammonia and phosphoric salts, lights, heat, electricity, etc. present, so that a protein compound was chemically formed ready to undergo still more complex changes."[1]

Many summarize abiogenesis—coupled with its more famous twin, Darwinian macroevolution—in a somewhat disparaging but memorable way: "From the goo to you by way of the zoo!"[2] Let's use this phrase to help us understand what is meant by "abiogenesis."

The "goo" refers to the "primordial soup" or "warm little pond" where non-life is said to have given birth to life. "You" is representative of the most advanced form of life that emerged from the process of genetic mutations and natural selection. The "zoo" is the medley of creatures—bacteria, fish, lemurs, apes, etc.—that lie between the goo and you.

Let's look more closely at the front end of this formulation—the goo, if you will.

[1] Charles Darwin to botanist Joseph Hooker, 1871. Full quote available at John C. Priscu, "Origin and Evolution of Life on a Frozen Earth," *National Science Foundation,* www.nsf.gov/news/special_reports/darwin/textonly/polar_essay1.jsp.

[2] Macroevolution is the undirected development of life on Earth from the simplest organism to human beings—which involves the construction and introduction of new features, systems, and species. Microevolution represents changes, usually within a species, based on adaptation. There is abundant evidence that changes can occur within existing species, so microevolution is largely uncontroversial and accepted by the majority of scientists. However, macroevolution and Darwin's theory that the processes of microevolution could account for macroevolution were controversial from the start. For more on the derivation of the terms and the ensuing controversy, see Casey Luskin, "Busting Another Darwinist Myth: Have ID Proponents Invented Terms Like 'Microevolution' and 'Macroevolution'?" *Evolution News and Views,* September 13, 2007, https://evolutionnews.org/2007/09/busting_another_darwinist_myth_2/.

Primordial Soup

The heyday of the primordial soup hypothesis occurred almost a century ago. British scientist J. B. S. Haldane and Russian scientist A. I. Oparin were the first to attempt to breathe life—pun intended—into Darwin's concept of a warm little pond. Oparin and Haldane theorized that Earth's early atmosphere had a set of chemicals that, when dissolved in water and energized by lightning, might have produced the first living cells.[3]

The Haldane–Oparin hypothesis remained untested until the work of American graduate student Stanley L. Miller and his PhD advisor, Harold C. Urey. In 1953, the two discharged an electric spark into a mixture of gases thought to replicate early Earth's atmosphere, and the experiment produced a few of the first building blocks of life. This was considered a landmark in the development of the abiogenesis origin story, and it is still cited in many textbooks.

However, as we now know, there was a major problem with the Miller–Urey experiment. The gases used to simulate the atmosphere of early Earth were reducing gases—that is, they lacked oxygen, which tends to break down the organic molecules needed to build life.[4]

This may not seem to be much of an issue. But by the 1960s a number of geophysicists and earth scientists had concluded that the atmosphere of early Earth originated from volcanoes and contained water vapor.[5] Why does this matter? Water vapor contains oxygen and therefore would have been fatal to organic synthesis in the primordial soup.[6] By the early 1980s, geologists even found evidence of oxygen in rocks dated to be 3.7 billion years old.[7]

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All of this means that the Miller–Urey experiment misrepresented the atmosphere of the early Earth. Moreover, the compounds the experiment did produce fall short of that required for even the simplest forms of life.[8] For these reasons, the experiment cannot rightly be used as evidence for abiogenesis.

[3] This paragraph and those that follow in this section summarize chapter 2, "The Miller-Urey Experiment," in Jonathan Wells, *Icons of Evolution: Science or Myth?* (Washington DC: Regnery Publishing, 2000).

[4] As Wells explains in chapter 2 of *Icons of Evolution* (see previous note), this is true although we tend to think of oxygen as vital to life. Oxygen is indeed required for respiration, but the same oxygen that is essential to aerobic respiration is often fatal to organic synthesis.

[5] Kevin Zahnle, Laura Schaefer, and Bruce Fegley, "Earth's Early Atmospheres" in *Cold Spring Harbor Perspectives in Biology* (Oct. 2010), available at http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2944365/.

[6] Additional oxygen was added by photosynthesis in plants.

[7] Zahnle, Scaefer, and Fegley.

[8] Ibid.

Directed Panspermia

Not to be discouraged, abiogenesis advocates began looking at other possibilities. Francis Crick knew from his Nobel prize–winning discovery of DNA that the molecular machinery of the simplest living cell was far too complex to be the work of random processes, so in 1973 Crick and British chemist Leslie Orgel proposed the theory of directed panspermia.

Directed panspermia suggests that "the seeds of life may have been purposely spread by an advanced extraterrestrial civilization."[9] That is, life was brought to earth from a planet in another galaxy.

However, panspermia is no longer considered a serious explanation for the beginning of life because of the virtual impossibility of interstellar transport of life.[10] Moreover, the theory lacks explanatory power. Panspermia fails to solve the origin problem; it proposes only that life somehow originated elsewhere.

"THE ORIGIN OF LIFE APPEARS AT THE MOMENT TO BE ALMOST A MIRACLE, SO MANY ARE THE CONDITIONS WHICH WOULD HAVE HAD TO HAVE BEEN SATISFIED TO GET IT GOING." —FRANCIS CRICK

Francis Crick himself admitted the difficulty of scientifically defining the origin of life: "An honest man, armed with all the knowledge available to us now, could only state that in some sense, the origin of life appears at the moment to be almost a miracle, so many are the conditions which would have had to have been satisfied to get it going."[11]

A Tornado in a Junkyard

In 1981 Sir Fred Hoyle and Chandra Wickramasinghe wrote *Evolution from Space.*[12] In an oft-quoted section of the book they calculated the odds that the required set of enzymes for even the simplest living cell could come together by chance alone. Their final number was one in $10^{40,000}$ (i.e., 10 followed by 40,000 zeroes).

[9] Lee Speigel, "UK Scientists: Aliens May Have Sent Space Seeds To Create Life On Earth," *Huffington Post*, February 13, 2015, http://www.huffingtonpost.com/2015/02/03/aliens-send-space-seed-to-earth_n_6608582.html.

[10] See Casey Luskin, "Panspermia, Environmental Alarmism, Socialism, Gaia, Nazi-Comparisons, and More: *Cosmo's* Endgame Is Becoming Clear," *Evolution News and Views*, http://www.evolutionnews.org/2014/05/panspermia_envi085801.html. Luskin quotes Simon Conway Morris, noted British paleobiologist and a member of the Royal Academy. Morris states why panspermia, directed or otherwise, is no longer the consensus view among scientists: "The idea that we might represent marooned colonists—perhaps from a long-dead planet engulfed in some stellar catastrophe—has a romantic appeal that taps a recurrent root in humans of displacement and longing. Not, of course, that these hypothetical colonists would be anything more than bacteria or some such equivalent. In any event, the history of life provides no evidence (although perhaps it should) of any subsequent visitation, let alone intervention, by extraterrestrials. Of course, getting even bacteria across interstellar wastes, those cubic parsecs of hard vacuum drenched in radiation, is in itself so problematic that it may be reasonable to suppose that if panspermia (that is, transport from one star system to another) occurs at all it can only be by a directed, that is, an intelligent activity." (Simon Conway Morris, *Life's Solution* [Oxford: Oxford University Press, 2005], 26). Luskin notes that that Morris is saying, ironically, that if directed panspermia were to have occurred, it would have required intelligent design.

[11] Francis Crick, *Life Itself* (New York: Simon and Schuster, 1981), 88.

[12] Fred Hoyle and Chandra Wickramasinghe, *Evolution from Space: A Theory of Cosmic Creationism* (London: Touchstone Publishing, 1984).

To put this mind-boggling number into perspective, the number of atoms in the entire universe is estimated to be 10^{80} (or 10 followed by 80 zeroes). Hoyle made an even more colorful illustration of these odds. He compared the likelihood of the random emergence of even the simplest cell to the likelihood that "a tornado sweeping through a junkyard might assemble a Boeing 747 from the materials therein."[13]

Hoyle was an atheist but believed that some impersonal life force had planted Earth with the seeds of life from space—a form of New Age panspermia.[14] In short, some kind of an impersonal intelligent designer was involved in the creation of life on Earth.

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Failing the "Tour Test

Chemical evolution—abiogenesis—is recognized as distinct from biological evolution because the latter depends on the existence of life before random mutation and natural selection can give rise to the diversity of life we see. On the other hand, chemicals do not reproduce or mutate, nor do they compete for survival. As such, perhaps it is chemists, not just biologists, who should weigh in on the topic of whether or not chemical evolution has naturally occurred.

PERHAPS IT IS CHEMISTS, NOT JUST BIOLOGISTS, WHO SHOULD WEIGH IN ON THE TOPIC OF WHETHER OR NOT CHEMICAL EVOLUTION HAS NATURALLY OCCURRED.

James Tour, a professor of chemistry at Rice University, is said to be one of the ten most cited chemists in the world. Confessing his doubts about macroevolution, Tour describes the origin of life problem as "even more scientifically mysterious than evolution."[15]

Dr. Tour has issued a challenge to fellow scientists. He offers a free lunch to any scientist who can sit down with him and explain the process of macroevolution in detail:

> I simply do not understand, chemically, how macroevolution could have happened. . . . When I . . . ask proponents for clarification, they get flustered in public and confessional in private wherein they sheepishly confess that they really don't understand either. Well, that is all I am saying: I do not understand. But I am saying it publicly as opposed to privately. Does anyone understand the chemical details behind macroevolution? If so, I would like to sit with that person and be taught, so I invite them to meet with me. Lunch will be my treat. Until then, I will maintain that no chemist understands, hence we are collectively bewildered. And I have not even addressed origin of first life issues. For me, that is even more scientifically mysterious than evolution. . . . Present day scientists that expose their thoughts on this become ever so timid when they talk with me privately. I simply cannot understand the source of their confidence when addressing their positions publicly.[16]

So far no one has taken Tour up on his offer for lunch.

[13] "1a – The Problem with Evolution," *Esoteric Science,* https://evolvingsouls.com/book/article1a/.

[14] Hoyle's impersonal but intelligent life force is explained in his book of the same title. Fred Hoyle and Chandra Wickramasinghe, *Cosmic Life-Force: The Power of Life Across the Universe* (London: J. M. Dent & Sons Ltd., 1988).

[15] "A world-famous chemist tells the truth: there's no scientist alive today who understands macroevolution," *Uncommon Descent*, http://www.uncommondescent.com/intelligent-design/a-world-famous-chemist-tells-the-truth-theres-no-scientist-alive-today-who-understands-macroevolution/.

[16] Ibid.

The Chicken (DNA) or the Egg (RNA)?

Any attempt to take up Tour's challenge will need to deal with a variety of conundrums. This includes explaining the naturalistic origins of deoxyribonucleic acid (DNA)—which contains the coded instructions used in the development and functioning of all living organisms—and ribonucleic acid (RNA)—which carries DNA's instructions for the synthesis of proteins.

JUST AS THE CHICKEN IS NEEDED TO MAKE THE EGG AND VICE VERSA, DNA IS NEEDED IN THE COMPLEX BIOLOGICAL PROCESS OF FORMING RNA AND VICE VERSA.

The situation is similar to the age-old question of which came first—the chicken or the egg? Just as the chicken is needed to make the egg and vice versa, DNA is needed in the complex biological process of forming RNA and vice versa.

If an abiogenesis account is to pass Tour's test, it must account for a non-guided, purely natural process of getting DNA from RNA, or vice versa. Having given up on a DNA-first theory, abiogenesis advocates are currently working to show how RNA could have developed naturally and then given rise to DNA. Among origin of life researchers, this is referred to as the RNA world hypothesis. (To say that both DNA and RNA molecules appeared simultaneously would essentially be invoking a miracle.)

IF LIFE IS DEFINED AS AN ORGANISM THAT DERIVES ENERGY FROM ITS SURROUNDINGS AND CAN REPLICATE ITSELF, THEN LIFE CAN BE CREATED IN THE LAB RATHER THAN FROM A PARENT ORGANISM.

When reading the speculative leaps required for a naturalistic origin of DNA (with or without the RNA first hypothesis), I am reminded of a joke about two economists walking through a dark cemetery at night. They fall into a freshly dug pit for an upcoming burial. After trying desperately to climb the vertical walls, they sit dejectedly in the dark pit. Finally, one says excitedly to the other, "I have a solution! Assume we have a ladder . . ."

Unfortunately, the pathway to the RNA world is a collection of assumed ladders.[17]

Creating Life in the Lab: Evidence For or Against Intelligent Design?

Does the "creation" of life in the lab argue for or against abiogenesis?

If life is defined as an organism that derives energy from its surroundings and can replicate itself, then life can be created in the lab rather than from a parent organism. Although most of the debate over artificial and designer life-forms has to do with the terrifying prospects of new biological weapons or the unintended consequences of "playing God," the development of new life-forms in the laboratory also raises the question: If we can create artificial life in a laboratory, why insist on a supernatural origin?

[17] A description of this hypothesis put out by the University of California at Berkeley is noteworthy for its absence of specifics. See "How Did Life Originate?" *Understanding Evolution for Teachers*, http://evolution.berkeley.edu/evolibrary/article/origsoflife_04.

As biochemist Fazale Rana points out, the artificial life-forms we can now develop in laboratories actually underscore the need for an intelligent designer more than they provide evidence of abiogenesis.[18] How so?

IT IS PRECISELY THIS NECESSITY OF INTELLIGENT AGENCY THAT THE GENESIS ORIGIN STORY ADDRESSES.

Rana refers to the incredibly complicated, precise process on which all origin-of-life laboratory studies rely. Scientists must set up the apparatus just right to contain the specific chemical reaction they want to study; add the carefully measured chemicals in a specific order; adjust the temperature; control the composition of the headspace above the reaction; regulate the pH of the reaction; and even, as with the original Miller–Urey experiments in the 1950s, withdraw compounds that would inhibit the formation of the desired reaction.[19]

This use of technology and knowledge more closely resembles intelligent design than what we could expect of the random collision of forces in the natural world. "Even though these experiments are designed to validate a naturalistic explanation for life's origin, they end up demonstrating the necessity of intelligent agency in creating life from inanimate matter," concludes Rana.[20]

The Genesis Story: Supernatural Agency

It is precisely this necessity of intelligent agency that the Genesis origin story addresses. Found in the Bible, the Genesis story centers on a supernatural Creator—God. Though there are different views regarding the details of creation, all who subscribe to the Genesis origin story believe that God created the world and all life in it.

THE BIG BANG THEORY POSES NO REAL OPPOSITION TO THE MESSAGE OF THE GENESIS STORY.

Though written for a group of nomadic tribesmen rather than a modern science journal, Genesis gets the sequence of created life-forms right—i.e., it is consistent with the fossil record—and does so using poetic imagery intelligible to both primitive cultures and modern readers.

Currently, cosmologists agree that the Big Bang was the beginning of all space, time, energy, and matter. The Big Bang Theory poses no real opposition to the message of the Genesis story. In fact, many prominent scientists have concluded that the Big Bang is evidence of the role of the supernatural in the creation of our natural world.[21]

[18] Fazale Rana, "How Did God Create the First Life on Earth?" *Reasons to Believe,* June 12, 2014, https://www.reasons.org/explore/blogs/todays-new-reason-to-believe/read/tnrtb/2014/06/12/how-did-god-create-the-first-life-on-earth.

[19] Ibid.

[20] Ibid.

[21] Quotes from scientists on the theistic implications of fine-tuning can be found at "Mind Expanding Quotes on a Fine-Tuned Universe & Biosphere," *Graduate Christian Union,* March 5, 2013, https://ubcgcu.org/2014/08/22/mind-expanding-quotes-on-fine-tuning/.

The scientific case for a supernatural origin of the universe can be summarized as follows: Big Bang cosmology points to a sudden beginning of the universe some 13.7 billion years ago. Since the natural world is made up of all matter, energy, space, and time—and since everything that begins to exist must have a cause outside of itself—the universe must have had a supernatural beginning.

That is, all matter, energy, space, and time could not have been created by matter, energy, space, and time—there had to be an outside force. This supernatural beginning had to be outside of time (eternal) and, based on the exquisite fine-tuning of the constants of physics and the design of the universe, mostly likely had to be all-knowing and all-powerful. The Creator God presented in Genesis fits this description.

Plausibility Must Be Considered

If modern cosmology is pointing toward a supernatural beginning to the universe, and if modern science thus far fails to support naturalistic explanations for life's beginnings, doesn't the Genesis story seem at least as plausible as abiogenesis?

As we noted at the onset of this article, origin stories throughout history shed light on our innate questions regarding the purpose and meaning of life. Each of us must decide if, based on our current knowledge, we trace our ancestry to the primordial "slime" or the biblical sublime.

[22] Photo Credit: Joel Filipe | Unsplash