

The Law of Biogenesis: Life & Matter come from Life

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History of “Biogenesis”

The word “biogenesis” was first used in 1870 by English biologist Thomas Henry Huxley, as acknowledged by American astrophysicist/biologist Carl Sagan in 1974:

“there has been an increasing misuse of the word ‘biogenesis’. [...] ‘Biogenesis’ is being used as its own antonym: ‘Biogenesis’ is the origin of life from life; ‘abiogenesis’, the origin of life from non-living matter. The distinction should be preserved. [...] The distinction goes back at least as far as Huxley (1870), who wrote in a work entitled ‘Biogenesis and Abiogenesis’¹...”²

Underlying observations supporting biogenesis, at least in the Western world, were apparently first documented by Italian physician Francesco Reddi (1626-1697), who may have been the first to challenge the notion of the spontaneous generation of life from nonlife. French chemist Louis Pasteur (1822-1895) officially disproved spontaneous generation with his swan-neck flask experiment. Pasteur concluded that “all life is from life” (Latin: *omne vivum ex vivo*). Similarly, German physician Rudolf Virchow (1821-1902) said that “every cell comes from another cell” (Latin: *omnis cellula e cellula*).

This concept is still relevant in contemporary science. In 2005, accomplished experimental physicist Robert Sheldon published “Historical development of the distinction between bio- and abiogenesis” and concluded that “an Aristotelian description of purpose, or teleology [...] should be incorporated into the current scientific paradigm” and demonstrated “the consistency of biogenic hypotheses over abiogenic using Baysean probabilities [with the hope that] such calculations will become more common in the future of the field.”³

As early as 1973, Vaishnava monk and global spiritual pioneer Srila A.C. Bhaktivedanta Swami Prabhupada emphasized that in addition to life coming from life, matter also comes from life. These observations hold significance for determining the origin of life and matter. The purpose

¹ Huxley, T. H. 1870. *Collected Essays* 8, 229-271, D. Appleton, New York.

² Sagan, C. 1974. *Origins of Life* 5, 529. D. Reidel Publishing Company, Dordrecht-Holland

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https://www.researchgate.net/publication/228386582_Historical_development_of_the_distinction_between_bio-_and_abiogenesis

of this article is to demonstrate the validity of the observation that matter comes from life and show how its rational development leads to the necessity for philosophy and conceptual thinking.

Matter comes from Life

Driven by humanity's impetus to discover extraterrestrial life, the necessity of unambiguously distinguishing between life and nonlife has become of central importance to modern science. In order to determine a valid biosignature that would indicate whether a particular celestial body harbored life, scientists have turned to what is called Assembly Theory. This theory is significant because it recognizes "that living systems can be distinguished from non-living systems as they produce complex molecules in abundance which cannot form randomly."⁴ By assigning an assembly index (AI) — a value determined by the shortest pathway to create a specific complex molecule — scientists are able to determine if the molecule was created from life or nonlife. This accounts for the history of the object, i.e. how its simple parts were assembled into a complex structure, which allows scientists to distinguish "those [molecules] so complex they require a vast amount of encoded information to produce their structures, which means that their abiotic formation is very unlikely." This is related to the field of cellular sentience/cognition pioneered by scientists like Nobel laureate Barbara McClintock and molecular biologist James A. Shapiro. The AI measures the degree of complexity in general without taking into account the unique nature of the specific molecule. This flexibility allows for the possibility of discovering new biogenic molecules that are not found in lifeforms on Earth. "The analysis is susceptible to false negatives [...] But perhaps more importantly, the experiment produced no false positives: Abiotic systems can't muster sufficiently high AIs to mimic biology."⁵ Some claim that Assembly Theory is "indistinguishable from algorithmic information and Bennett's logical depth introduced in the 1960s" and that such preexisting work is not properly credited.⁶ Whether or not this is the case, Assembly Theory makes important conclusions derived from empirical approaches regarding the clear distinction between life and nonlife accessible to the public. Such work provides a noteworthy contribution to a society that is still dominated by a materialistic worldview that completely reduces life to nonlife.

As acknowledged by Pasteur and Virchow, life coming from life is observed every time organisms reproduce or cells undergo mitosis. Srila Prabhupada pointed out that an example of matter coming from life was fingernails continually growing throughout the course of a single lifetime. The same can be said of hair growth. Actually, we observe an abundance of mass being generated solely from living entities (biomass): tremendous amounts of wood growing from tiny

⁴ <https://www.nature.com/articles/s41467-021-23258-x>

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<https://www.quantamagazine.org/a-new-theory-for-the-assembly-of-life-in-the-universe-20230504/>

⁶ <https://hectorzenil.medium.com/test-8f0be54817c4>

seeds, mollusks producing a variety of shells, and the numerous molted exoskeletons of arthropods like horseshoe crabs. An interesting graphic was created for “Visualizing the Biomass of Life.”⁷ Planet Earth’s atmosphere is also derived from living entities. “Currently, nearly 99% of primary production of oxygen comes from eukaryotic algae but prokaryotic bacteria were responsible for forming the oxygen on the Earth.”⁸ “Thus, microorganisms have probably determined the basic composition of Earth’s atmosphere since the origin of life.”⁹ Even the existence of fossil fuels relies on life, i.e. the decomposing of plants and animals — not to mention tar, wax, and rubber/latex. These are all examples of the creation of matter as a byproduct of the life cycle of living organisms — matter coming from life. Beyond these immediate instances, which may seem scattered and lacking a comprehensive account of how all matter in the universe comes from life, a more complete explanation results when we recognize the relationship between consciousness and matter.

After hundreds of years of being ignored by modern science, the role that consciousness plays in observing nature slowly became relevant throughout the 1900s due to phenomena that were inexplicable in the paradigm of classical physics and the resultant rise of quantum theory. Observations of wave-particle duality during the double-slit experiment necessitated inquiring about the role of the observer in determining the wave-particle state of an electron. One of the pioneers of quantum theory, German physicist Werner Heisenberg (1901-1976), clearly acknowledged that “Classical physics can be considered as that idealization in which we speak about the world as entirely separated from ourselves” while “Quantum theory does not allow a completely objective description of nature.” The observer effect reveals the fundamentally interdependent nature of the subject and object — conscious living agents and natural phenomena. Scientists conditioned by materialistic ideology are quick to evade this by asserting that a mechanical measuring device also produces the observer effect thus subjectivity is not being brought into the picture¹⁰, but Heisenberg emphatically explained:

“The measuring device deserves this name only if it is in close contact with the rest of the world, if there is an interaction between the device and the observer. Therefore, the uncertainty with respect to the microscopic behavior of the world will enter into the quantum-theoretical system here just as well as in the first interpretation. If the measuring device would be isolated from the rest of the world, it would be neither a measuring device nor could it be described in the terms of classical physics at all. [...] This again emphasizes a subjective element in the description of atomic events, since the measuring device has been constructed by the observer, and we have to remember that what we observe is not nature in itself but nature exposed to our method of questioning. [...] In this

⁷ <https://www.visualcapitalist.com/all-the-biomass-of-earth-in-one-graphic/>

⁸ <http://butane.chem.uiuc.edu/pshapley/environmental/130/1.html>

⁹ <http://butane.chem.uiuc.edu/pshapley/environmental/130/oxygen.pdf>

¹⁰ https://www.researchgate.net/publication/326795653_The_Observer_Effect

way quantum theory reminds us, as Bohr has put it, of the old wisdom that when searching for harmony in life one must never forget that in the drama of existence we are ourselves both players and spectators” (Heisenberg 1958, 57-58).¹¹

This conclusion of the intrinsically interdependent nature of the subject and object has been maintained by contemporary scientists. American theoretical physicist John Archibald Wheeler (1911-2008) said that the “universe does not ‘exist, out there,’ independent of all acts of observation. Instead, it is in some strange sense a participatory universe” (Wheeler 2003).¹² American medical doctor Robert Lanza has been recognized as one of the “100 Most Influential People in the World” and “Top 50 World Thinkers.” He calls for a biocentric model of reality, where life creates the universe, based on the most up-to-date cutting-edge research on the observer effect. Dr. Lanza’s recent paper published in one of the world’s leading journals in cosmology and astrophysics showed that the very structure of spacetime — both the gravitational constant and the effective cosmological constant — are determined by observers (Podolskiy, et al., 2021).¹³

There must be consciousness to actualize the potential of the world. The Big Bang theory begins by postulating a vacuum state which consists of the invisible potentialities of all the particles that can form or appear in the universe. That neutral vacuum state is the probability or pure potentiality of the inner product of the universal wave function with itself $\langle\Psi|\Psi^*\rangle$ that then requires consciousness to manifest or actualize any measurable phenomena. The Big Bang theory alone does not explain consciousness at all, thus, it is grossly incomplete and objectionable. Similarly, Darwinian evolution also ignores consciousness, as if we could talk about the science of traffic patterns without considering the conscious motives of drivers inside the vehicles. When seen as inclusive of the necessary role of consciousness the Big Bang could be consistent with quantum mechanics, however, it would not be an explanation of the origin of matter but of the actualization of matter from its dormant state of unmanifested potentiality. An account of the origin of matter should address “why the laws of physics exist, why they have the form they have, or in what kind of manifestation they existed before the universe existed (which [is necessary if] they brought the universe into existence)”, as acknowledged by South African theoretical physicist George Ellis.¹⁴ Such an explanation would require an “Aristotelian

¹¹ Heisenberg, Werner. 1958. *Physics and Philosophy: The Revolution in Modern Science*. Harper & Brothers Publishers. New York.

¹² Wheeler, John. 2003. “Observer-Created Reality.” In *The Tests of Time*, 484-492. <https://doi.org/10.1515/9781400889167-063>

¹³ Podolskiy, Dmitriy, Andrei O. Barvinsky, and Robert Lanza. 2021. "Parisi-Sourlas-like dimensional reduction of quantum gravity in the presence of observers." *Journal of Cosmology and Astroparticle Physics*, Volume 2021. DOI 10.1088/1475-7516/2021/05/048

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<https://blogs.scientificamerican.com/cross-check/is-lawrence-krauss-a-physicist-or-just-a-bad-philosopher/>

description of purpose, or teleology” as recognized by Robert Sheldon who was referenced earlier.

The fundamental particles that constitute the universe require consciousness to collapse the wave function and determine or actualize matter. Consciousness implies life, i.e. that there is a conscious living agent. German philosopher G.W.F. Hegel (1770-1831) shows that the self-development of the Absolute Idea contains both life and consciousness, where life is the immediacy of Spirit — Spirit’s being-in-itself — and consciousness is the being-for-itself of Spirit. When conceived in their maturity, life and consciousness are encompassed in the Absolute Idea which is in-and-for-itself. This will become clearer toward the end of the article. In this way, in addition to the more immediate observations of biomass and biomass derivatives previously discussed, we can clearly see that matter comes from life. We have also already established that life comes from life. These facts concerning consciousness, matter, and life constitute the Law of Biogenesis.

So, empirical observation affirms the Law of Biogenesis, that life and matter come from life. From cells to organisms, living offspring only come from living parents. Following this a posteriori reasoning (“relating to or derived by reasoning from observed facts”¹⁵), we must recognize that the origin of life is categorically different from natural life, while simultaneously maintaining an identity with it. Since new life necessarily depends on preexisting life, and such preexisting life also necessarily depended on other preexisting lives, etc, then the original life from which this dynamic organic process unfurled must be independent of preexisting life.

The necessity for an original life arises from remaining consistent with the observation of biogenesis in nature. Clearly, preexisting life exists prior in time to the resultant new life. Children appear later in time than parents. Thus, there is a linear succession of generations one after another. Without an original life, we have an infinite regress of lifeforms with no starting point thus indicating a circular process. Accommodating such a circular process without violating the linear succession of generations implies that the first lifeform(s) in the sequence somehow spawn(s) from the last lifeform(s), while the last life depends on the first to initiate the living process that eventually led to its birth. The main issue is that time travel would be necessary for the last life to give birth to the first, which is absurd for finite entities.

The Origin of Life

Remaining consistent with the observation of biogenesis in nature necessarily compels us to rationally consider an independent self-caused original life. This original life would depend on nothing but itself for its existence, while all resultant lifeforms depend on it as the original causal

¹⁵ <https://www.merriam-webster.com/dictionary/a%20posteriori>

agent. So far, this has been a posteriori reasoning originally derived from empirical observation, however, we have reached a turning point. Continuing to unbiasedly pursue the path of reason in consideration of how something can be the cause of itself requires a shift from sensuous thinking to conceptual thinking. In order to continue making progress here we must embrace philosophy.

A dutiful commitment to soberly and comprehensively explaining natural phenomena requires that we move beyond the senses into the milieu of pure thought and reason. Dr. Bhakti Madhava Puri, Serving Director of the Princeton Bhakti Vedanta Institute, succinctly recognized that “Text without context is the pretext of knowledge. One of the greatest limitations of scientific thinking is the inability of scientists to understand the fallacy of context-free analysis.” Dr. Puri also articulated that “thought and thing are etymologically related — they are also ontologically related.” The context of *everything* is thought.

The original life and all resultant natural life are an identity-in-difference. They are identical in quality but different in quantity, similar to the Sun and the photons that reach Earth. Photons have the same potency as the Sun since they originate from it but that potency is manifest to a much smaller degree. The original life must be completely independent of other influences, otherwise we get into the mess of accommodating a circular process without violating the linear succession of generations previously described, thus the original life is self-determined, absolute, and infinite. On the other hand, natural life is intrinsically dependent on its origin and environment thus it is relative and finite. Historically this absolute, infinite, self-determined first cause is known to be God.

Western philosopher Baruch Spinoza (1632-1677) elucidated the concept of self-causation (Latin: *causa sui*) as God. It is notable that Albert Einstein (1879-1955) professed belief in “Spinoza’s God.”¹⁶ Interestingly, René Descartes (1596-1650) also soberly engaged with the idea of God as self-caused.¹⁷ This concept has been known in the East since ancient times as evident from the Vedic text *Brahma-samhita* verse 5.1:

*isvarah paramah krsnah saccidananda-vigrahah
anadir adir govinda sarvva-karana-karanam*

“The Supreme Lord, the Embodiment of Truth, Consciousness and Joy, is Govinda Krishna. He is beginningless, the Origin of all that be, and **the Cause of all causes.**”

If the systematic development of reason, starting from sober observations of nature, leads to theology, then it must be accepted as a necessary and scientific conclusion. This is spiritual science. In his *Phenomenology of Spirit*, Hegel describes the development of spirit coming to

¹⁶ <https://momentmag.com/einstein-and-his-god/>

¹⁷ <https://onlinelibrary.wiley.com/doi/abs/10.1002/9781119538349.ch11>

know itself as Spirit through different forms of consciousness, and in the three-volume *Encyclopedia of the Philosophical Sciences* the necessary development through and transition between Logic, Nature, and Spirit (mind-body-spirit) is thoroughly traced out. The Absolute Idea being in-and-for-itself, which necessarily requires both life (in-itself of Spirit) and consciousness (for-itself of Spirit), is determined through Hegel's dialectic approach which avoids the age-old dichotomy between nondual and dual views of reality by elucidating the identity-in-difference of thought and being (subject and object). True reality is thinking-being. His systematic philosophy shows the necessity of concluding that the Absolute is not only substance but also subject or Divine Personality. This is the same conclusion held by the Bhagavat Vedanta tradition. Directly engaging with proven processes that arrive at this conclusion, Hegel's dialectic method of conceptual thinking and the Vedic practice of *bhakti-yoga*, is nonsectarian spiritual education. We are working to scientifically establish an accessible knowledge of Spirit — the self-conscious, dynamic, organic whole that encompasses and underlies our experienced reality, like pretty pearls resting on a discreet thread.

It will prove productive and rewarding for further research concerned with the origin and nature of life and consciousness to soberly consider the implications of the Law of Biogenesis and to remain open-minded about the Science of Spirit. We welcome collaboration with sincere individuals who value the ideas discussed here — please do not hesitate to contact us if you are so inclined.