

Advanced “Earth Conditions”

Corrections to the Miller/Urey 1953 Hypothesis and Its Necessary Implications

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In a brief but important article published in 1953, Stanley L. Miller (1930 – 2007), with the assistance of Nobel Prize winner, chemist, and physicist Harold C. Urey, showed how an already existing, intelligent human being under simple but intentionally set-up, controlled, and managed conditions could generate amino acids.¹ Since amino acids have been wrongly called the basic building blocks of life for many decades, it is no surprise to find those who do so simultaneously rely on Miller-Urey to show these so-called “building blocks of life” could accidentally form under Miller-Urey’s conditions. Here is a more recent example from LiveScience (with my underlining):

An old experiment, rediscovered after more than 50 years, may demonstrate how volcanoes – and possibly chemical reactions far from primitive Earth in outer space – played a role in creating the first amino acids, the building blocks of life. In 1953, chemists Harold Urey and Stanley Miller performed a landmark experiment intended to mimic the primordial conditions that created the first amino acids, by exposing a mix of gases to a lightning-like electrical discharge.²

Setting aside the fact shown by others that the conditions proposed by Miller in his 1953 article for his and Urey’s early-Earth model’s atmosphere are basically impossible,³ Miller-Urey’s

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¹ See Stanley L. Miller, “A Production of Amino Acids Under Possible Primitive Earth Conditions,” *Science* 117 (May 15, 1953), pages 528-529 (available here: <http://www.sciencemag.org/content/117/3046/528.full.pdf> [last accessed: January 7, 2019]).

² Wynne Parry, “Possible Key to Life’s Chemistry Revealed in 50-Year-Old Experiment,” *LiveScience* (March 21, 2011), link: <https://www.livescience.com/13339-primordial-soup-chemistry-reaction-amino-acids-life.html>. See also the entry for “Harold Urey” at FamousScientists.org (<https://www.famousscientists.org/harold-urey/>) which states in part: “[Urey] deduced that Earth’s early atmosphere consisted mainly of hydrogen, ammonia, methane, and water and that these would react with one another when lightning passed through them. His graduate student, Stanley Miller, performed the famous Miller-Urey experiment which demonstrated that when electric sparks pass through a mixture of these simple gases the products are amino acids – the building blocks of life” (underlining added).

³ Consider the following observations in Ed Yong’s, “Scientists finish a 53-year-old classic experiment on the origins of life,” *Discover* (March 21, 2011):

By analysing ancient rocks, scientists have since found that Earth was never particularly teeming in hydrogen-rich gases like methane, hydrogen sulphide or hydrogen itself. If you repeat Miller’s experiment with a more realistic mixture – heavy in carbon dioxide and nitrogen, with just trace amounts of other gases – you’d have a hard time finding amino acids in the resulting brew. Parker ... suggests that a few specific places on the planet may have had the right conditions. Exploding volcanoes ... throw up masses of sulphurous compounds, as well as methane and ammonia. These gases, belched forth into lightning storms, could have produced amino acids that rained out and gathered in tidal pools. But [Jim] Kasting [who studies the evolution of Earth’s atmosphere] still isn’t convinced. “Even then the reduced gases would not be as concentrated as they are in this experiment.” Even if our young planet had the right conditions to produce amino acids, that’s a less

conclusions continue to be spread by these and by other sources as if they are legitimate. This mistaken view, combined with the incorrect belief that amino acids are the “building blocks of life,” has fed the *unscientific* conclusion that life can evolve from the accidental formation of amino acids under the right conditions. Fortunately, more tempered studies using the Miller-Urey experiment have also been published. For example, in 2014 a group of scientists conducting Miller-Urey experiments concluded:

The classic Miller-Urey experiment demonstrated that amino acids, important building blocks of biological proteins, can be synthesized using simple starting materials under simulated prebiotic terrestrial conditions. The excitation of gaseous molecules by electric discharge leads to the production of organic compounds, including amino acids, under such conditions. While amino acids are important for contemporary biology, the Miller-Urey experiment only provides one possible mechanism for their abiotic synthesis, and does not explain the origin of life, as the processes that give rise to living organisms were likely more complex than the formation of simple organic molecules.⁴

So some progress has been made, it seems, when it comes to the terminology about “amino acids” and “life.” Still, it must be emphasized once more that real science shows every single day there is no basis for concluding amino acids are the building blocks of “life.” Rather, the best available evidence shows amino acids are the blocks of protein, which is a part of physical, living things. But neither individual amino acids nor complete proteins are “life” or could ever ‘build’ into “life” as we know it apart from an intelligent design (such as human reproduction). We know this because at death something which kept the person ‘alive’ or living is gone, even though the body’s protein/amino acids are still in place for a time after a person dies.

Therefore, based on what we regularly experience after a person dies amino acids are not in any real sense the “building blocks of life,” as is commonly taught. It is scientific to conclude protein/amino acids do not ‘build life’ since this is what we experience consistently and without exception. By contrast, based on how humans build things, when we consider the uses of amino acids and proteins as part of physical bodies, it is easy to see how an intelligent being like but beyond us could similarly use proteins/amino acids to build physical bodies, which then could be made alive by some other means, just as we use various metals and other components to build a robot and then use electricity to turn it “on.”

Though not a subject for extended discussion in this paper, an intelligent being building a human body and then using some other means to bring it to “life,” similar to how we build and then turn

impressive feat than it appeared in the 1950s. “Amino acids are old hat and are a million miles from life,” says Nick Lane [a biochemist writer]. Indeed, ... it’s not difficult to create amino acids. The far bigger challenge is to create nucleic acids – the building blocks of molecules like RNA and DNA. The origin of life lies in the origin of these “replicators”, molecules that can make copies of themselves. Lane says, “Even if you can make amino acids (and nucleic acids) under soup conditions, it has little if any bearing on the origin of life.” The problem is that replicators don’t spontaneously emerge from a mixture of their building blocks, just as you wouldn’t hope to build a car by throwing some parts into a swimming pool. Nucleic acids are innately “shy”. They need to be strong-armed into forming more complex molecules, and it’s unlikely that the odd bolt of lightning would have been enough. The molecules must have been concentrated in the same place, with a constant supply of energy and catalysts to speed things up. “Without that lot, life will never get started ...,” says Lane [link: <http://blogs.discovermagazine.com/notrocketscience/2011/03/21/scientists-finish-a-53-year-old-classic-experiment-on-the-origins-of-life/#.XDEYnvZFzIV>].

⁴ Eric T. Parker, James H. Cleaves, Aaron S. Burton, Daniel P. Glavin, Jason P. Dworkin, Manshui Zhou, Jeffrey L. Bada, Facundo M. Fernandez, “Conducting Miller-Urey Experiments,” *Journal of Visualized Experiments* 83 (January 21, 2014), page 13 (underlining added); link: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4089479/>.

a robot “on,” is exactly what we read in Genesis and in Psalms about God building Adam and Eve and using the “breath of life” or his “spirit” to make them alive, or to cause death by taking away the power source: spirit.—Genesis 2:7-8, 21-22; Psalm 104:29-30.

Related to this, as I will further show in the balance of this article, Miller-Urey’s experiment actually demonstrates the opposite of what they concluded, namely, for amino acids to form under the proposed conditions of the Miller-Urey experiment there *must have been* intelligent life already existing to create the conditions like Miller did, with assistance from Urey: Two intelligent human beings created the conditions and the apparatus and put in place and maintained the controls necessary for a result. Miller’s 1953 experiment, though incorrect in terms of the type of atmosphere proposed for our early-Earth, nonetheless demonstrated the necessity of intelligence for such early-Earth conditions.

Notice the latter part of the title of Miller’s 1953 article, with my underlining, “... Under Possible Primitive Earth Conditions.” In earlier versions of this paper I used the term “Likely” in my title, and here I have changed that term to “Necessary,” since I am unaware of any evidence showing a laboratory, an apparatus, or controlled and maintained conditions occur like we see in Miller-Urey absent intelligence. This is certainly the case with the Miller-Urey experiment, related to Miller’s 1953 paper. Therefore, it is not necessary to hedge on this point at all: Scientifically, intelligence is required before you can have a laboratory, an apparatus in which to conduct an electro-chemical experiment, and before you can control and maintain conditions within the apparatus which is itself controlled and maintained within the laboratory.

In this paper I will argue the conditions under which a production of amino acids must have occurred were anything but “primitive,” and, in fact, they were far more advanced than Miller-Urey by comparison. Since as I will further show Miller-Urey did not account for the primary agents in their production of amino acids, namely, Miller-Urey (and anyone else who may have assisted them), if we include Miller-Urey then the conclusion we reach is not only “possible” or “likely” but *necessary*, since there are no exceptions. Miller-Urey have shown we must presently conclude the conditions for the production of amino acids, if at all similar to the Miller-Urey experiment, were intelligently designed, set up, and maintained from the start. This can be shown both by a careful evaluation of Miller’s 1953 article, and by a comparative consideration of other similarly designed, created, and intelligently maintained experiment “apparatus(es)” and conditions for amino acid production.

Due to the brevity of the Miller-Urey article, it is practical here for me to quote extensively from it while discussing its content and conclusions. As I do so, I will explain how Miller-Urey and others who may cite their experiment as a basis for concluding anything other than an intentionally intelligent (and, thus, an already existing or) living being similarly put together the necessary controls and the required “apparatus(es)” for the production of amino acids, are not basing their conclusions on the best available evidence. I will show this in the balance of this paper, using in large part as my evidence Miller’s 1953 article, the opening paragraph of which reads:

The idea that the organic compounds that serve as the basis of life were formed when the earth had an atmosphere of methane, ammonia, water, and hydrogen instead of carbon dioxide, nitrogen, oxygen, and water was suggested by Oparin and has been given emphasis recently by Urey and Bernal.

The “idea” expressed here by Miller-Urey begins with and is only possible because of already existing (and, hence, existentially unexplained) beliefs concerning 1) the Earth, 2) the Earth’s atmosphere, 3) the gases methane, ammonia, water, and hydrogen, but 4) not the existence (or,

rather, presence in the proposed early-Earth atmosphere) of carbon dioxide, nitrogen, oxygen, and water, the presence or absence of which is subsequently and further 5) controlled by a living (and, hence, already existing), intentionally intelligent being (in this case, Miller-Urey).

These are the conditions which are the foundation for what follows in the Miller-Urey experiment, which experiment then proceeds according to Miller as follows (with underlining added):

In order to test this hypothesis, an apparatus was built to circulate CH₄, NH₃, H₂O, and H₂ past an electric discharge. The resulting mixture has been tested for amino acids by paper chromatography. Electrical discharge was used to form free radicals instead of ultraviolet light, because quartz absorbs wavelengths short enough to cause photo-dissociation of the gases. Electrical discharge may have played a significant role in the formation of compounds in the primitive atmosphere.

In fact, we can say the Miller-Urey hypothesis *requires* an intentionally intelligent, already existing being first to design and then to build “an apparatus” which can then “circulate” the already existing (but, again, existentially unexplained or unaccounted for) gases through “an electric discharge.” Even the electrical discharge must have been intentionally generated or put in place by an already existing human being, in this case Miller-Urey.

Only after all these things are completed is there a “resulting mixture” which (with my underlining) the “electrical discharge was used to form.” Note again the language used by Miller-Urey, “... *was used to form.*” But how was it “used”? If the ‘use’ comes from within the intentionally designed, built, and maintained apparatus (which it does) then the resulting mixture and any ‘use’ within the apparatus is also, ultimately, the product of the same intentional intelligence(s) who designed, built, and maintained the same apparatus (again, Miller-Urey) for this purpose.

However, note the Miller-Urey conclusion, “Electrical discharge may have played a significant role in the formation of compounds in the primitive atmosphere,” which misses all of the earlier described, surrounding and, in fact, foundational elements which gave rise to the “electrical discharge” in the first place. Indeed, Miller-Urey attribute more causation to the presence of the “electrical discharge” than they do to their own intelligent design and planning which resulted in the electrical discharge.

Based on the Miller-Urey experiment, and in view of the lack of any other type of non-intentional, or “un-intelligent” experiment which could produce any similar results, the evidence indicates we must conclude differently from “may have” (= Miller-Urey) and instead conclude ‘electrical discharge necessarily played a significant role in the formation of compounds in the [proposed early-Earth’s] primitive atmosphere.’ However, demonstrably related and, even foundational, to this same conclusion is the acceptance of the existence of intelligent beings capable of arranging for and maintaining these same or similar-type components and conditions. This is, in fact, what Miller-Urey showed by their experiment.

I will here repeat my earlier contention: The Miller-Urey 1953 experiment can only be used to show *an already existing, intelligent being necessarily* “played a significant role in the formation of compounds in the primitive” or, rather, our *earlier* Earth’s “atmosphere,” if it resembled Miller-Urey’s proposed atmospheric conditions. This is precisely what Miller-Urey demonstrated and it is consistent with everything else which can be repeatedly shown using similarly intelligent and

intentionally designed apparatuses filled with measured components along with intelligently set temperatures and other controlled conditions over a period of time.⁵

There is no basis in the Miller-Urey experiment for concluding anything other than under the very same or similar conditions an already existing, intelligent being designed, built, and then used a controlled and conditioned “apparatus” for the production of compounds such as amino acids, though this still does not explain what is “life” or how “life” came to be part of physical things comprised of (among other things) amino acids. Returning to Miller, page 528, paragraph 3:

The apparatus used is shown in Figure 1. Water is boiled in the flask, mixes with the gases in the 5-l flask, circulates past the electrodes, condenses and empties back into the boiling flask. The U-tube prevents circulation in the opposite direction. The acids and amino acids formed in the discharge, not being volatile, accumulate in the water phase. The circulation of the gases is quite slow, but this seems to be an asset, because production was less in a different apparatus with an aspirator arrangement to promote circulation. The discharge, a small corona, was provided by an induction coil designed for detection of leaks in vacuum apparatus.

The intentionally designed and intelligently built apparatus (shown on page 7 of this article) is then used by an already existing being (Miller-Urey) to ‘boil water.’ The boiled water is then intentionally ‘mixed with gases’ and ‘circulated past electrodes’ before the intelligently built apparatus by design “empties” the mixture “back into the boiling flask.” Once again, intelligence is shown in the apparatus’ designed *prevention* of ‘circulation in the opposite direction,’ this so the “amino acids formed in the discharge ... accumulate in the water phase.”

Subsequently, Miller-Urey noted varying degrees of success in the resulting “production” as it relates to “a different apparatus” which was also designed and built by an intelligent, already existing being (Miller-Urey). Indeed, the “small corona” discharge “was provided by an induction coil” which was (with my underlining) “designed for detection of leaks in vacuum apparatus.” Miller then writes:

The experimental procedure was to seal off the opening in the boiling flask after adding 200 ml of water, evacuate the air, add 10 cm pressure of H₂, 20 cm of CH₄, and 20 cm of MH₃. The water in the flask was boiled, and the discharge was run continuously for a week.

The “procedure” described already to this point by Miller shows clearly an already existing, intelligent being had to “seal off the opening in the boiling flask.” This was done *after* the same already existing, intelligent being added water, removed the air, and then added measured quantities of specific gases exclusive of other gases. After all this, then the “water in the flask was boiled” and the discharge “run continuously for a week.”

To this point it should be kept in mind Miller fails to note his/Urey’s own intelligent involvement in this “experimental procedure.” Miller continues:

During the run the water in the flask became noticeably pink after the first day, and by the end of the week the solution was deep red and turbid. Most of the turbidity was due to colloidal silica from the glass. The red color is due to organic compounds adsorbed [adsorbed involves one substance sticking to another substance (GS)] on the silica. Also present are yellow organic compounds of which only a small fraction can be extracted with ether, and which form a continuous streak tapering off at the bottom of a one-dimensional chromatogram run in butanol-acetic acid. These substances are being investigated further.

⁵ As an example, note Miller-Urey’s use of “an aspirator arrangement to promote circulation.”— Miller, “A Production of Amino Acids,” page 528.

Here Miller describes what took place *after* they arranged for the earlier described and controlled conditions. From the apparatus to the boiling water, to the measured and included gases to any gases intentionally excluded, from the air present to the vacated air, without Miller-Urey none of this would have happened. This is because it is Miller-Urey who intentionally created the above-described conditions; it is Miller-Urey who set in motion the circulation of a mixture past electrodes; and it is Miller-Urey who are also responsible for the following parts of this experiment:

At the end of the run the solution in the boiling flask was removed and 1 ml of saturated HgCl₂ was added to prevent the growth of living organisms. The ampholytes were separated from the rest of the constituents by adding Ba(OH)₂ and evaporating *in vacuo* to remove amines, adding H₂SO₄ and evaporating to remove the acids, neutralizing with Ba(OH)₂, filtering and concentrating *in vacuo*.

Again, without Miller-Urey none of this would have been possible. Therefore, the Miller-Urey 1953 subject experiment shows even for amino acids to be formed there likely were intelligently designed, arranged, and controlled conditions in early-Earth’s atmosphere, which have been maintained ever since. The obvious conclusion which results from a complete consideration of the involved person(s), the designed and built equipment, the included and excluded gases, and the other intentionally controlled conditions in this experiment is what makes the first full paragraph-sentence on page 529 of Miller’s article so surprising (with my underlining added):

The amino acids are not due to living organisms because their growth would be prevented by the boiling water during the run, and by the HgCl₂, Ba(OH)₂, H₂SO₄ during the analysis.

And yet there is no question, ultimately, and rather immediately in the Miller-Urey experiment, the amino acids *are* ‘due to a living organism,’ for at the very least (though it can and it does go farther⁶) *they are due to Miller-Urey*.

Just as Miller-Urey arranged for the conditions of this experiment so, too, there must have been one or more intelligent and powerful beings who similarly existed during early-Earth’s “primitive” condition, one or more beings who like Miller-Urey should be credited for the productions which likely occurred through similarly ordered, constructed, controlled, and maintained operations.

The second and third full paragraphs on Miller-Urey page 529 further describe the results of their experiment, which ended up producing a small amount of amino acids. In their fourth paragraph Miller-Urey reference the “apparatus” which was designed and created for use in this experiment, namely:

⁶ See my articles, “The Origin of Life Is Life (or Something or Someone Already Alive),” *Watching the Ministry* (January 13, 2010), link: <http://elihubooks.blogspot.com/2010/01/origin-of-life-is-life-or-something-or.html>; “The CWJ Argument for God’s Eternal, Intelligent Existence,” *Watching the Ministry* (December 31, 2017 [rev. June 5, 2018]), <http://elihubooks.blogspot.com/2017/12/the-cwj-argument-for-gods-eternal.html>, where I provide arguments for the origin of “life” as *life*, or rather as something or as someone already alive which shows, ultimately, since life is here now then life must also be eternal.

Miller-Urey “Apparatus”⁷

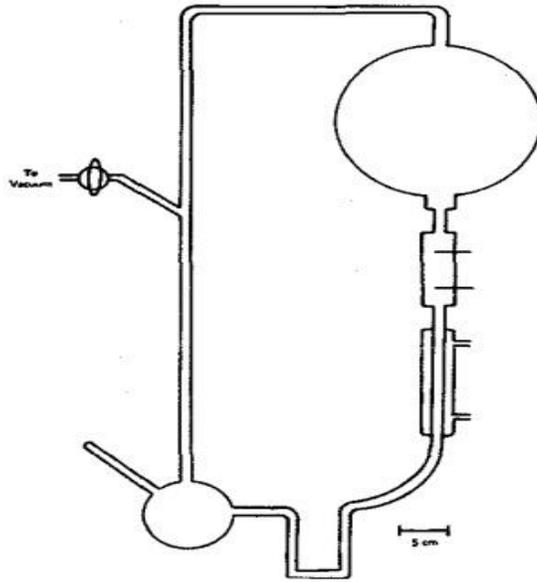
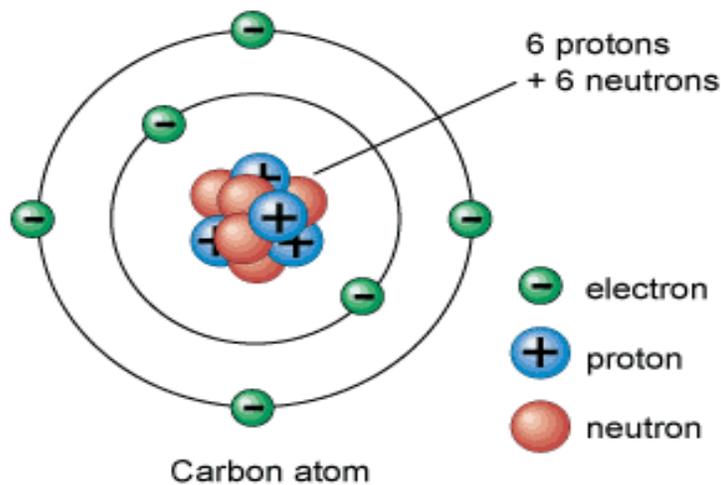


FIG. 1.

In the second-to-last paragraph of their article, Miller-Urey open with a closing summary of their experiment by writing, “In this apparatus [the one above] an attempt was made [by Miller-Urey, already existing, intelligent beings] to duplicate a primitive atmosphere of the earth.” As noted already, what resulted from this experiment was the production of amino acids which, though a small “yield,” according to Miller-Urey “with a more efficient apparatus ... this type of process would be a way of commercially producing amino acids.”

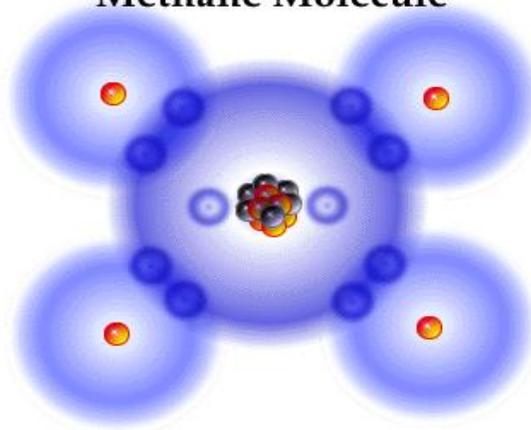
However, if a small yield of amino acids took this much intelligent life and material to produce, in the light of the Miller-Urey experiment it must have taken an incredible amount of intelligence and control to design, to create, and to maintain “apparatus(es)” and “building blocks” such as the following:



[Image link: http://www.phy.cuhk.edu.hk/phyworld/articles/laser/c-atom_e.gif (last accessed January 06, 2019).]

⁷ See Miller, “A Production of Amino Acids Under Possible Primitive Earth Conditions,” page 528.

Methane Molecule

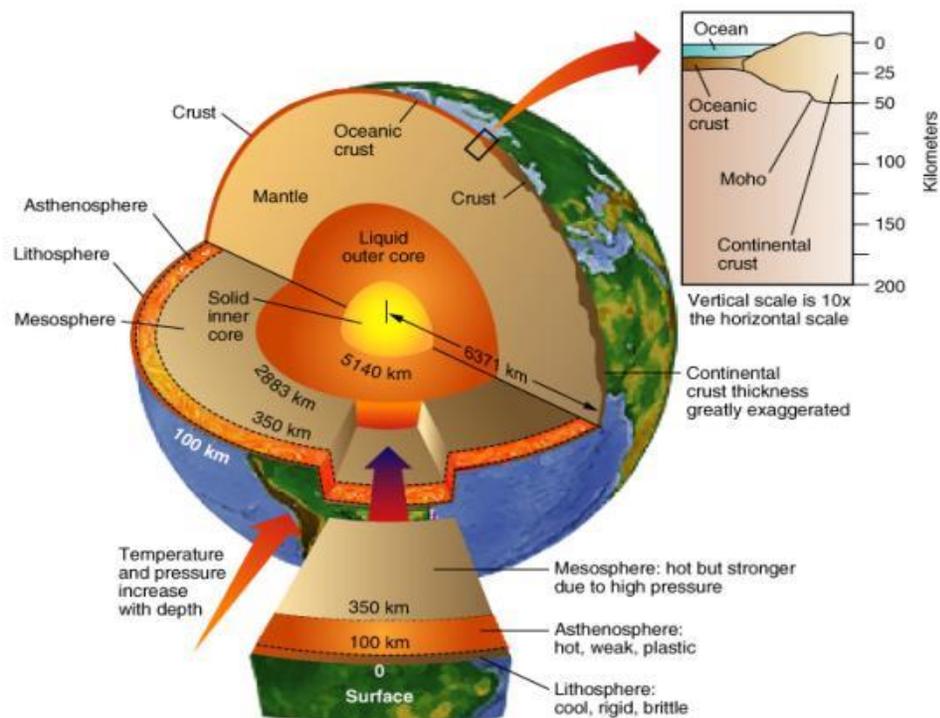


[Image link:

<http://www.brooklyn.cuny.edu/bc/ahp/SDgraphics/PSgraphics/Methane.GIF>

(last accessed January 06, 2019).]

Layers of the Earth



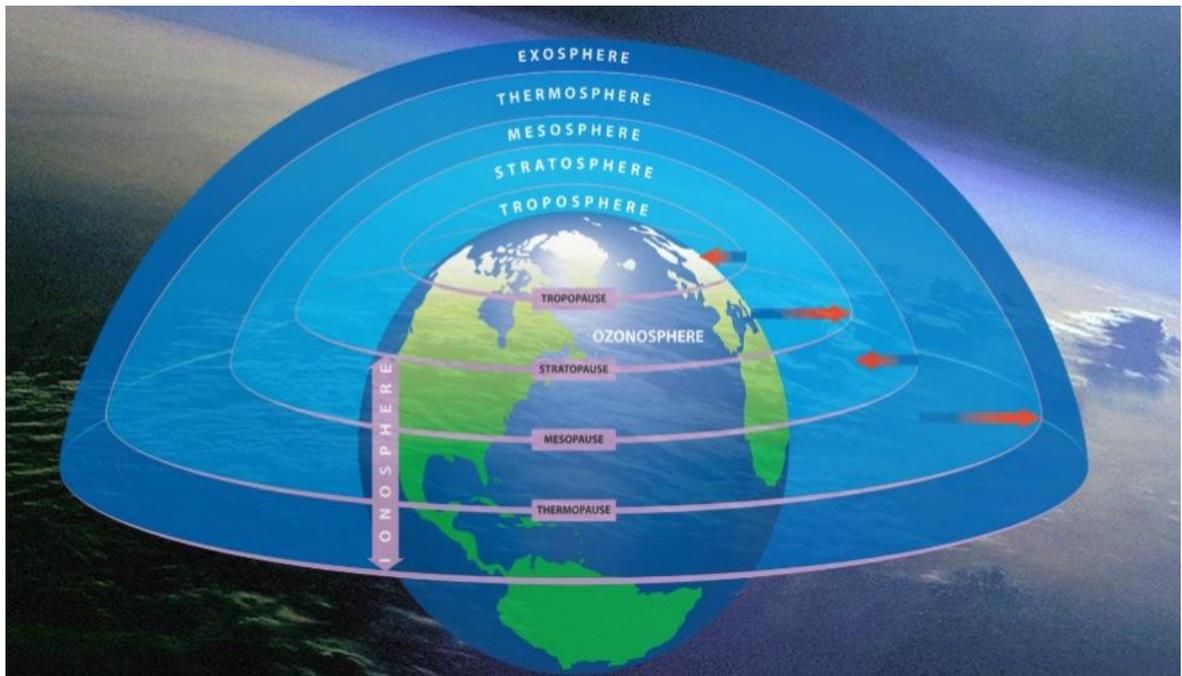
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[Image link:

<https://img.haikudeck.com/mg/FDAED26A-3342-41AE-9C17-DECBF9835E5F.jpg>

(last accessed January 06, 2019).]

The Layers of Earth’s Atmosphere

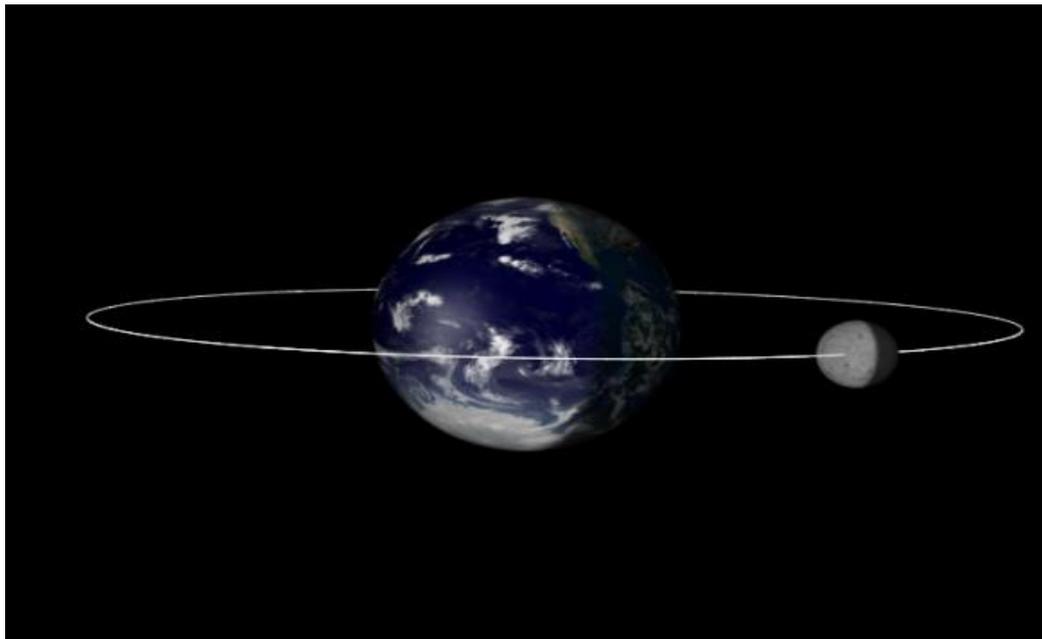


[Image link:

https://i0.wp.com/www.letsstudytogether.co/wp-content/uploads/2017/06/earth_0.jpg?fit=1278%2C652&ssl=1

(last accessed January 06, 2019).]

The Earth and Its Moon in Orbit

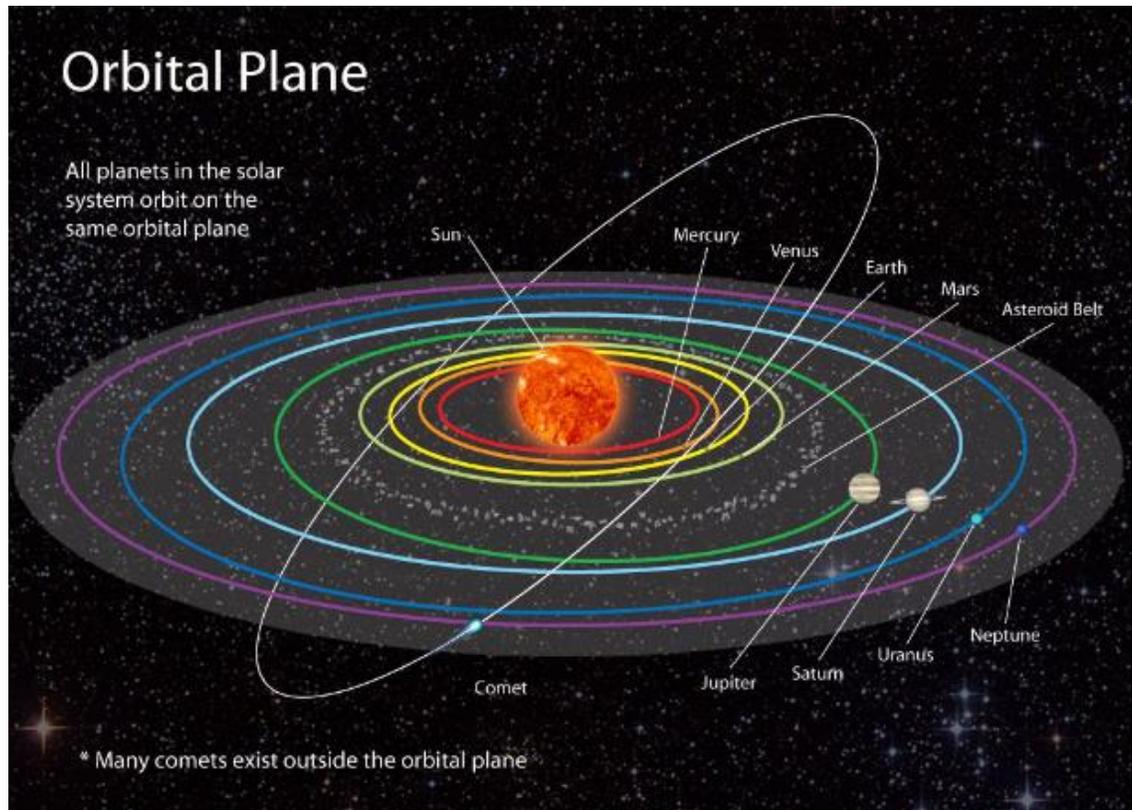


[Image from Neptune, late 2003, with each body magnified by 20; source link:

http://xplanet.sourceforge.net/Gallery/20031202_earth/earth.png

(last accessed January 06, 2019).]

Our Solar System

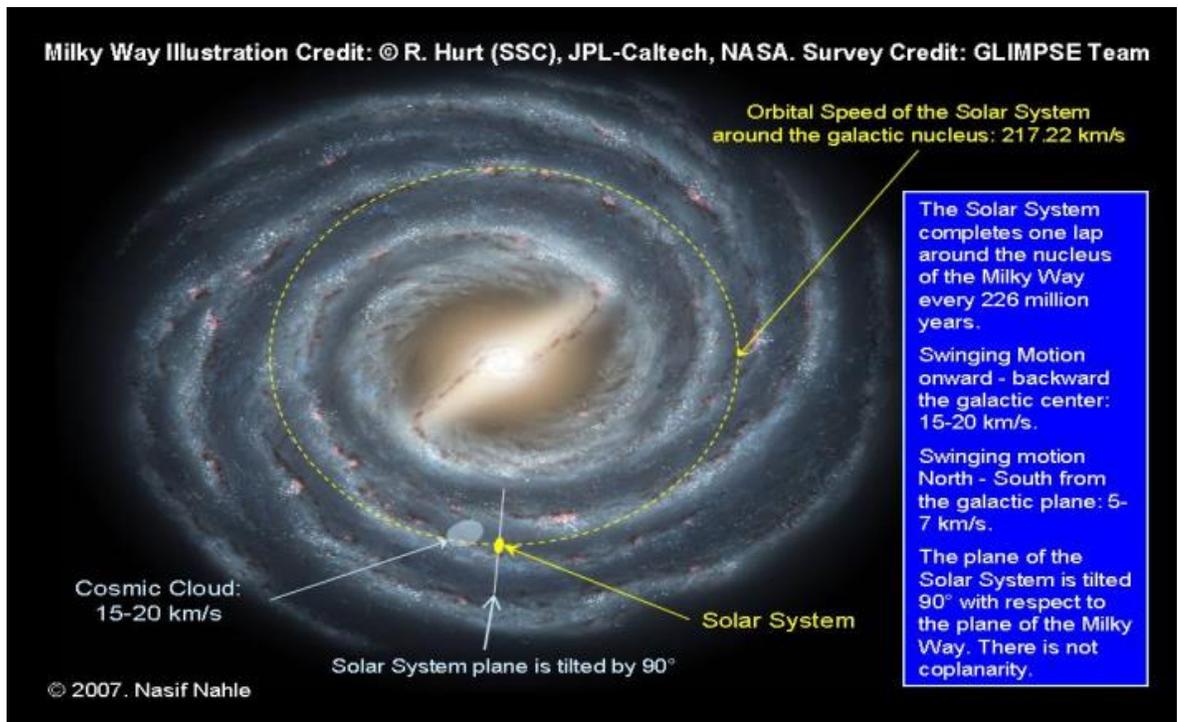


[Image link:

<https://media.nationalgeographic.org/assets/photos/000/285/28546.jpg>

(last accessed February 8, 2013).]

Our Milky Way Galaxy



[Image link:

http://biocab.org/Cosmic_Cloud-Solar_System-Milky_Way.jpg

(last accessed January 06, 2019).]

Like the Miller-Urey “apparatus,” these systems or structures show intelligence, but in ways which go beyond what Miller-Urey saw as the primary implications of their 1953 experiment. Rather than support the belief intentional intelligence was *not* needed in order to produce amino acids under early earth’s conditions, the Miller-Urey experiment shows there *must have been* an intelligent, already living being capable and desirous of designing, building, and then putting into place and into operation the right apparatuses with controlled, maintained conditions.

At its beginning, in its middle, and at its end the Miller-Urey experiment shows even for the formation of very basic compounds such as amino acids there likely was an already existing, intelligent being who designed and who then set up controlled conditions within which further creative results or productions took place. This is precisely the conclusion which I, too, believe results from the best available evidence, which evidence includes the Miller-Urey experiment.

What remains unclear is 1) why Miller-Urey took themselves out of the sequence of causes involved in and throughout their own experiment, and 2) why anyone else since Miller-Urey would similarly fail to promote or to highlight the *necessity* of intelligence behind the production of amino acids in early-Earth’s atmosphere. Indeed, Miller-Urey and their intelligently designed and arranged and maintained experiment are not simply “possible” conditions for the early earth’s production of basic compounds. The conditions demonstrated by and inclusive of the Miller-Urey 1953 experiment are *necessary* for the production of compounds like amino acids in our early Earth.

Miller-Urey ended up demonstrating the opposite of what they concluded as a result of this experiment. Given the extent to which the so-called “scientific community has embraced Miller-Urey and has continue to feed the lie that amino acids are the “building blocks of life,” one cannot help but recall what 1962 Nobel Prize winner in Physiology or Medicine James Watson (along with Francis Crick and Maurice Wilkins), once wrote, “One could not be a successful scientist without realizing that, in contrast to the popular conception supported by newspapers and mothers of scientists, a goodly number of scientists are not only narrow-minded and dull, but also just stupid.”⁸

⁸ James Watson, *The Double Helix: A Personal Account of the Discovery of the Structure of DNA* (Weidenfeld & Nicolson, London, 1968 [1998]), page 14.