Advanced "Earth Conditions"

Corrections to Miller's 1953 Hypothesis and Its *Likely* Indications

by

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July 4, 2010

In a very important but brief scientific article published in 1953, Stanley L. Miller showed how an already existing, intentionally intelligent (human) being under simple yet highly controlled and managed conditions could generate what have been called the basic building blocks of life (though not "life" itself), namely, amino acids (Stanley L. Miller, "A Production of Amino Acids Under Possible Primitive Earth Conditions," *Science* 117 [May 15, 1953], pages 528-529).

Note, however, the latter part of the title of Miller's article with my emphasis, "… *Under* Possible *Primitive Earth Conditions.*" In this paper I will argue that based on the best available reasons Miller's hypothesis is not simply "possible," but *likely*. Further, I will argue that the conditions under which such a production of amino acids *likely* occurred were not at all "primitive" but *advanced*, in that we would have to presently conclude, though without claiming to know for a certainty, that the conditions were similar to the very experiment which Miller conducted. This can be shown both by Miller's own experiment and by a comparative consideration of other types of what can also only be presently considered similarly designed, created, and maintained "apparatus(es)."

Throughout this paper I intend to also show that neither Miller nor the scientific community which has followed him appear to recognize the most important consequences of his experiment. Because of the brevity of Miller's article, it is practical here to quote extensively from Miller's 1953 study and then attempt to show and to explain how Miller and others who have cited him as a basis for concluding that anything other than an intentionally intelligent (and, thus, already existing or) living being similarly put together the necessary controls and the required "apparatus(es)" for life or for its basic "building blocks" are not basing their conclusions on the best available evidence, which evidence includes, in the case of Miller, his own experiment.

You can consider Miller's study and conclusions here in this paper, or by reading Miller's article separately yourself followed by a consideration of my response.[**] I recommend keeping both Miller's 1953 article and this review and response to the same together for convenience and for the most effective use in related studies, presentations, or discussions of these subjects.

Miller's opening paragraph 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.**

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[**] Miller's entire 1953 article can be obtained here: http://www.sciencemag.org/cgi/reprint/117/3046/528.

The "idea" expressed here begins with and is, thus, 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 earth's 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). *These conditions* are the foundation for what follows in Miller's experiment. Indeed, Miller writes:

> **In order to test this hypothesis, an apparatus was built to circulate CH_4, NH_3, H_2O, and H_2 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, Miller's hypothesis *requires* an intentionally intelligent, already existing being first design and then build "an apparatus" which can "circulate" the already existing (but existentially unexplained or unaccounted for) gases through "an electric discharge" which also had to be put in place or generated intentionally by the same already existing human being (Miller).

Only then comes the "resulting mixture" which (with my underlining) the "electrical discharge was used to form." Note again the language, "… *was used to form*." But, who 'used' it? It would have to be the same one who by means of intentional intelligence designed, created, controlled, and maintained the very apparatus involved, again, Miller.

However, note Miller's 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 attributes more to the presence of the "electrical discharge" than he credits his own actual, intentional cause of the discharge.

Based on Miller's experiment and in view of the lack of any other type of non-intentional, or "un-intelligent" experiment which could produce any similar results, I believe we must conclude differently from Miller's "may have" and say more than this, namely, that 'electrical discharge likely played a significant role in the formation of compounds in the [earth's] primitive atmosphere.' However, demonstrably related to and even foundational to this is the acceptance of the existence of an intentionally intelligent being capable of arranging for and maintaining these same or similar-type components and conditions in early earth's atmosphere because this is, in fact, what Miller did show with his own "apparatus."

I will repeat here my earlier contention: Miller's 1953 experiment can only be used to show that *an already existing, intentionally intelligent being* likely "played a significant role in the formation of compounds in the primitive" or, rather, "*earlier* atmosphere." I believe this because it is both 1) precisely what Miller demonstrated and 2) it is consistent with everything else which can be repeatedly demonstrated using similarly intelligent and intentionally designed apparatuses filled with measured and excluded components, along with controlled temperatures and other (circulation, for example) conditions.

Because of Miller's experiment, it is *likely* the atmosphere in which such formations (amino acids) occurred was not "primitive" if by this Miller means in any way not as *advanced* as he

would consider the same or similar conditions in his own intentionally intelligent experiment. There is no basis in Miller's experiment for concluding anything but that under those same or similar conditions an already existing being (like Miller) designed, built, and then used a controlled and conditioned "apparatus" for the production of compounds like amino acids.

Returning to Miller's 1953 article, page 528, paragraph 3:

> **The apparatus used is shown in Figure 1 [shown on page 4 of this paper (GS)]. 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 below with other, similar 'apparatuses') is then used by an already existing being to 'boil water.' The boiled water is then intentionally 'mixed with gases' and 'circulated past electrodes' before the intelligently designed apparatus "empties" the mixture "back into the boiling flask." Once again, the intentional intelligence is shown in the apparatus' *prevention* of 'circulation in the opposite direction,' this so the "amino acids formed in the discharge … accumulate in the water phase."

Miller notes varying degrees of success in the resulting "production" as it relates to "a different apparatus" which was also designed and built by an intentionally intelligent, already existing and living being (Miller). Indeed, the "small corona" discharge "was provided by an induction coil" which was (with my underlining) "<u>designed</u> 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, adding 10 cm of pressure of H_2, 20 cm of CH_4, and 20 cm of MH_3. The water in the flask was boiled, and the discharge was run continuously for a week.**

The "procedure" described earlier by Miller and then commented on further by me shows clearly that an already existing, intentionally intelligent being (Miller) 'sealed off the opening in the boiling flask.' This was done *after* the same already existing, intentionally 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."

However, to this point in his article Miller has failed to note *the necessity of himself* or of a similarly existing, intentionally intelligent being as part of 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 ["<u>ad</u>sorbed" 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.**

Here Miller simply describes what took place *after* he arranged for the earlier described and controlled conditions. Yet, from the apparatus to the boiling water, to the measured, included, and excluded gases to the vacated air, without Miller none of this would have been possible. At least in his 1953 experiment Miller did not show that such results could be achieved apart from an intentionally intelligent, already living being who arranged for and who measured and controlled the subject experiment's conditions, and so also its results in large part.

It is Miller who intentionally created the above described conditions, and it was Miller who also set in motion the circulation of a mixture past electrodes. It is Miller who is also responsible for the following parts of his experiment:

> **At the end of the run the solution in the boiling flask was removed and 1 ml of saturated $HgCl_2$ 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 H_2SO_4 and evaporating to remove the acids, neutralizing with $Ba(OH)_2$, filtering and concentrating *in vacuo*.**

Again, without Miller none of this would have been possible. Therefore, Miller's 1953 subject experiment shows that in order for even amino acids to be formed there likely were extensive conditions in the early earth's atmosphere intelligently designed and intentionally created or arranged and thereafter also maintained by the same living, intelligent being under controlled conditions. That is why Miller's first full paragraph-sentence on his page 529 is so surprising:

> **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 $HgCl_2$, $Ba(OH)_2$, H_2SO_4 during the analysis.**

And yet there is no question that, ultimately, and rather immediately, in fact, the amino acids *are* 'due to a living organism,' for at the very least (though it can and does go farther) *it is Miller!* Just as Miller was present and arranged for the conditions of his experiment, so also there must be one who similarly existed during earth's "primitive" or earlier condition, one who like Miller should be credited for the productions which have occurred through similarly ordered, constructed, controlled, and maintained 'experiments.'

Miller's second and third full paragraphs on his page 529 describe further the results of his experiment, which did end up producing a small amount of amino acids. In Miller's fourth paragraph, he references the "apparatus" he designed and created for his experiment, namely:

Miller's "Apparatus"
(See "A Production of Amino Acids" [1953], page 528.)

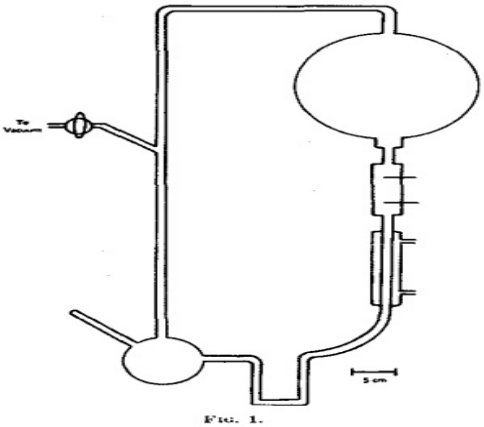
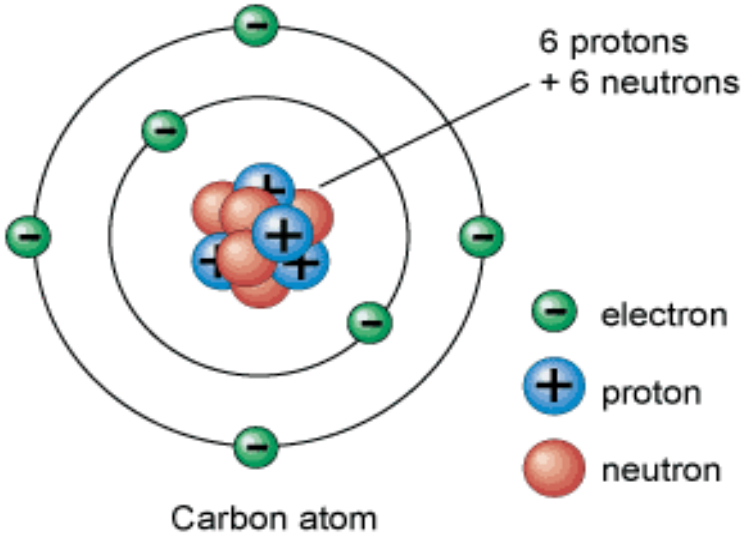


FIG. 1.

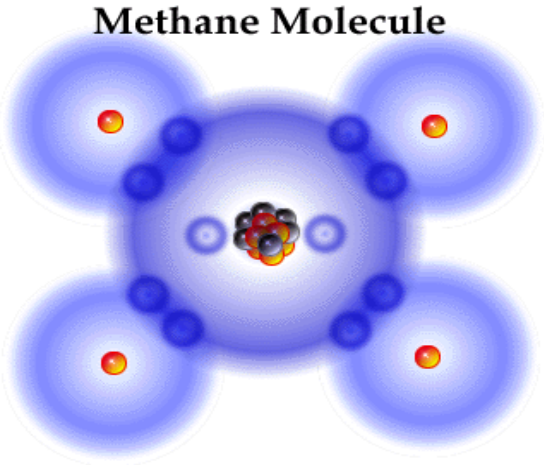
In this same second-to-last paragraph of his article, Miller opens in closing summary of his experiment by writing, “In this apparatus [the one above, which Miller designed and created] an attempt was made [by Miller, an already existing, intentionally intelligent being] to duplicate a primitive atmosphere of the earth.” Yet, what resulted was the production of amino acids which, though a small “yield,” according to Miller “with a more efficient apparatus ... this type of process would be a way of commercially producing amino acids.”

Whether “a more efficient apparatus” could ever be used in a commercial way, is a separate question. But if even a small yield of amino acids took this much existing and intelligent life and materials to construct the “apparatus” used by Miller, then in light of Miller’s experiment it must have taken an incredible amount more intelligence and power to design and then to create “apparatus(es)” such as the following:

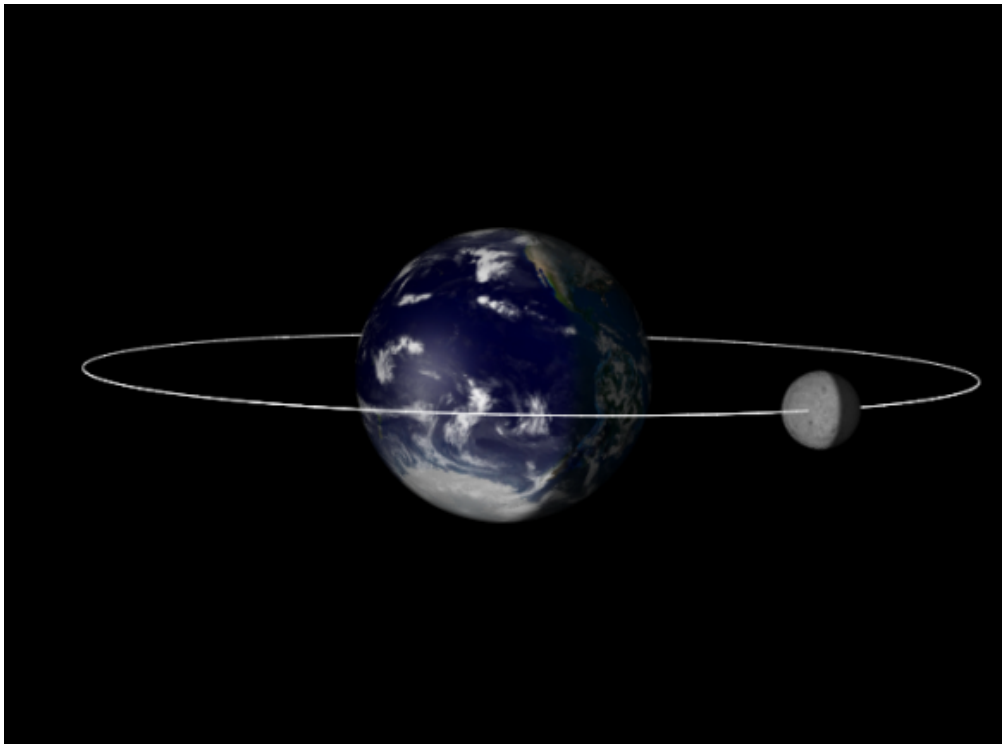
A Carbon Atom
(Link: http://www.phy.cuhk.edu.hk/phyworld/articles/laser/c-atom_e.gif.)



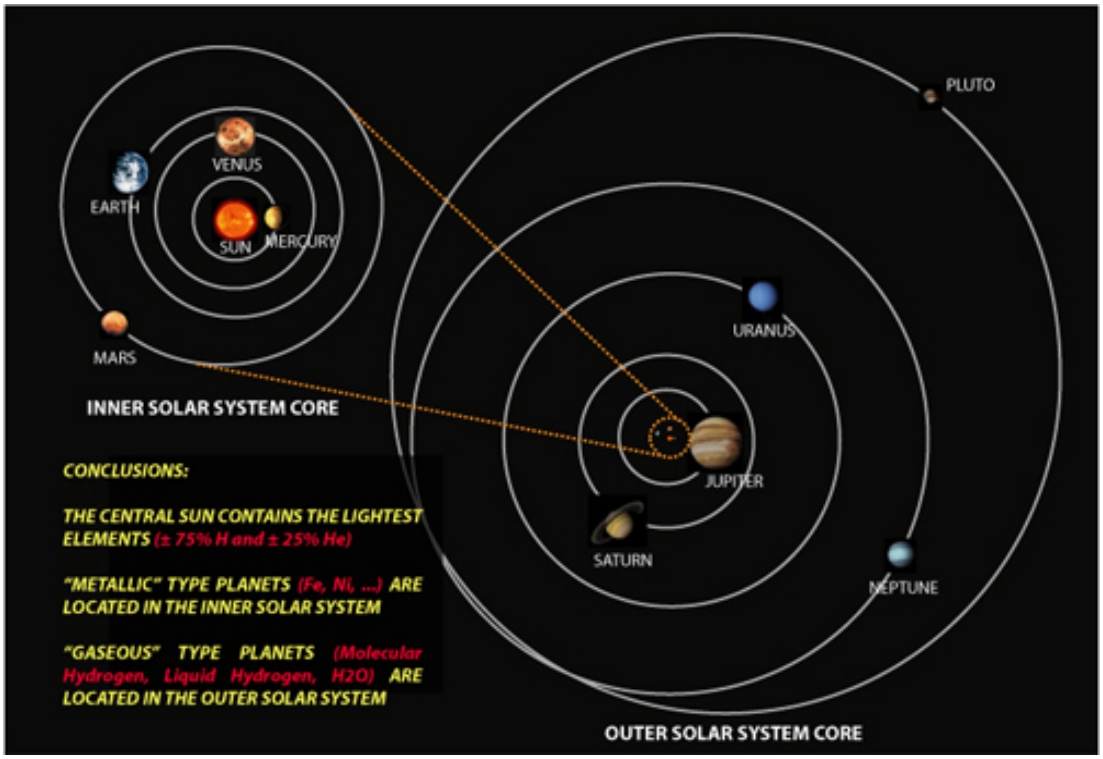
A Methane Molecule
(Link: http://www.brooklyn.cuny.edu/bc/ahp/SDgraphics/PSgraphics/Methane.GIF.)



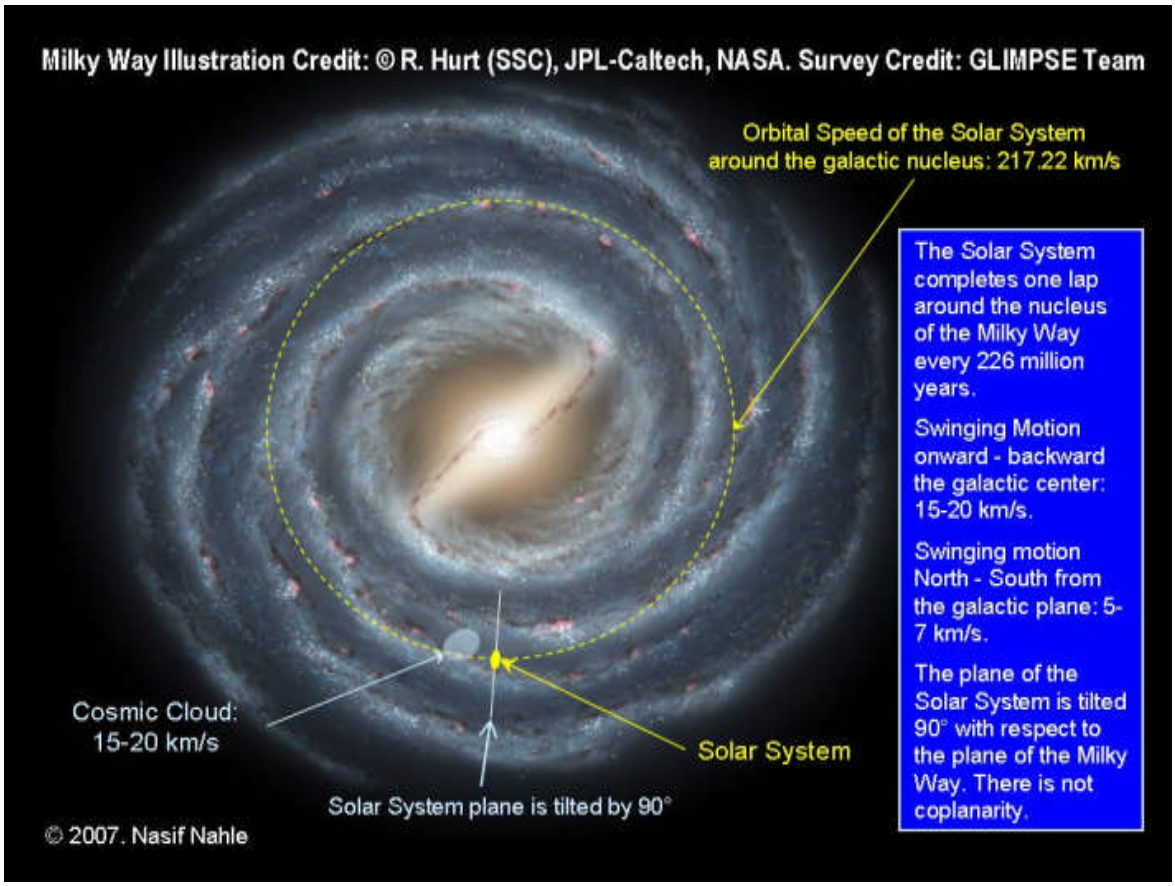
The Earth and Its Moon
(This is an image from Neptune, late 2003, with each body magnified by 20.)
[Link: http://xplanet.sourceforge.net/Gallery/20031202_earth/earth.png.]



Our Solar System
(Link: http://www.keshetechnologies.com/image/solar_system/Solar-system_500.jpg.)



Our Milky Way Galaxy
(Link: http://biocab.org/Cosmic_Cloud-Solar_System-Milky_Way.jpg.)



Like Miller's "apparatus," the above systems show intentional intelligence in more demonstrably efficient but also in ways similar to Miller's experiment. Yet, rather than support the belief that intentional intelligence was not needed in order to produce amino acids under such conditions, Miller's experiment shows clearly that there likely was an intentionally intelligent, very powerful (compared to Miller), already living being before any such productions likely occurred.

At its beginning, in the middle, and at the end Miller's experiment shows us that even for the formation of very basic compounds (such as amino acids) there likely was an existing, intentionally intelligent being who designed and 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. Miller's 1953 study is simply a part of that large body of evidence which supports the belief that a living, intentional intelligence was behind the production of amino acids and other compounds in the early earth's atmosphere, just as Miller is the one ultimately behind the production of amino acids in his experiment.

What remains unclear is 1) why Miller took himself out of the sequence of causes and other intentionally intelligent contributions involved in his experiment, and 2) why anyone else after Miller would similarly fail to promote or highlight the necessity of intentional intelligence behind the production of amino acids under early earth conditions. Indeed, Miller and his intelligently designed and arranged for experiment are not simply "possible" conditions for the early earth's production of such basic compounds. The conditions demonstrated by and inclusive

of Miller are, according to the best available reasons, *likely* to have existed in view of the great yield our early earth's atmosphere experienced.