

Parallel Thinking Part 21: The Formation of Life

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If one reflects for a moment on the composition of living things, a puzzle may soon develop. How can life emerge from the sterile, inanimate building blocks that are the foundation of all physical things? A carbon

atom is not alive, but the same carbon atoms that make up a lump of coal also help to form a human being; for it is these very same carbon atoms which make up organic compounds such as amino-acids, the building blocks of life.

The American chemist Stanley Miller (d. 2007) and his colleague Nobel laureate Harold Urey (d. 1981) became famous for producing amino-acids from inorganic substances through an experiment which used electrical sparks to mimic lightning in the early atmosphere, together with water vapour and the atmospheric gases likely to have been present on primordial Earth. From this he successfully produced many types of amino-acids. This gave rise to the idea that life on Earth emerged from a 'primordial soup', made up of these amino acids.

Yet there is a snag. Science journalist Claire Ainsworth explained that while the Miller experiment still "holds a great deal of water... details remain sketchy. It is still unclear, for example, how a primordial soup of simple molecules could give rise to today's system of DNA and proteins". Ainsworth explains that while DNA produce amino-acids which are the building blocks of protein, it is these very proteins which facilitate the reactions which replicate the DNA. She explains: "It is a classic chicken-and-egg problem". Furthermore, she points out that a sufficient concentration of amino acids is necessary in order to meet one another and react.

There are theories which address these points. While there is much more work to be done, it is

likely that scientists will eventually be able to explain how inorganic atoms and molecules can transform into organic structures which go on to produce self-replicating cells. But does that really answer the question of how life emerged from a particular arrangement of lifeless component parts?

One scientist that shaped my own interest in this question was medical journalist Dr. James Le Fanu. He highlights the difference between a mechanism by which something works and understanding the essence of that thing: "Much of the prestige of science lies in its ability to link together disparate observations to reveal the processes that underpin them. But this does not mean that science 'captures' the phenomena it describes – far from it". Life is more than the mere ability to self-replicate.

Rabbi Meir Leibush Wisser (known as the Malbim, d. 1879) notes that the Torah describes vegetation, sea-creatures and animals coming forth from the land and the water (Bereishit 1:11, 20 and 24). He explains that this means they were formed from pre-existent physical matter. Yet in addition, God created them *ex nihilo* – from nothing (Malbim on Bereishit 1:24). Though science is still struggling to come to terms with the beginnings of life on Earth, our Sages approached the question of Creation by proposing two complementary components for life. These distinct creations are physical form and spiritual essence. One is natural and spontaneous, the other a gift from God, but both are essential for life.

