Quest for a Creatorless Origin of Life - 15

There are more than 5,000 different kinds of catalysts of chemical processes in living organisms. Each one of these macromolecules must have the right physical shape to do its job. How possibly could such be made by random collisions of atoms? The very necessity of these catalysts in all existing organisms raises a huge problem for those hoping to find an explanation of how life could have been generated spontaneously.

In each living cell there are many chemical reactions occurring. For example, in the process of digestion, sucrose - table sugar - breaks down into glucose and fructose, and releases a burst of energy. But if the specific enzyme called sucrase - a protein catalyst - is not present, noting will happen. And so it is with a multitude of other chemical processes in the living cell.

But the enzyme for each different kind of chemical reaction must have a unique physical shape to do its job of speeding up that process. It acts like the spark plug in an internal combustion engine, which ignites the mixture of gasoline and air to burn the fuel and produce a burst of energy in the piston.

So the problem for those seeking a spontaneous origin of life is: the first living cell would need more than only the physical structure to be able to live, ingest food, grow, reproduce, etc. That cell would also need to have a separate macromolecule of the required shape - an enzyme - for each of the many life-supporting chemical processes which keep it alive - all on day one of its existence.

If just one enzyme, for promoting a life-supporting process, was missing, that cell could not exist as a living organism.

Feat of Clay? RNA is the polymer of a nucleic acid which carries the genetic code and facilitates the combining of molecules into proteins in the chemical factories of the cell. Scientists have attempted to simulate the process by which they believe the first RNA could have come into existence by natural processes. They prepared a solution of the smaller chemical components of RNA with a chemical which promotes the smaller bits to link up into chains.

By adding a small quantity of a clay to the solution, they caused the smaller components to form chains of up to fifty components long. The action by the clay appears to relate to its crystal structure - extremely thin sheets of one sort of material alternated with sheets of another material. The electrically charged surface of the sheets provide a reactive location to produce new chemicals.

Other scientists, making the same use of a clay, were able to interconnect series of amino acids into molecular chains which were similar to proteins. This seemed a promising explanation of how at least some of the first components of living organisms may have been produced by natural processes. But then came a problem.

Those nicely generated chemicals were not only bonded together, but also bonded to the mineral surface! This source of polymer was not going to be available to become a component of a living organism - it was not going anywhere. After much effort and expense the clay idea came to a dead end. Not only did it fail to produce life - it provided no evidence that it was in any way involved in a process leading up to the generation of life.