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The Origin of Eukaryotic Cells

by Bob Harsh

Where did life come from? Where did the first living cells come from? Where did the first eukaryotic cells come from? What in the world are eukaryotic cells and why are they important?

The easy answer to all of these questions is, God created all of these at the beginning intact and perfectly functional. The hard answers comes to us by way of “Evolutionary Naturalism”.

How life started by natural means is extremely difficult. Biologist, Charles Thaxton wrote, “However life began on earth, the usually conceived notion that life emerged from an oceanic soup of organic chemicals is a most implausible hypothesis. We may therefore with fairness call this scenario “the myth of the prebiotic soup.” [Thaxton.C. 1984. *The Mystery of Life's Origin: Reassessing Current Theories*,” Philosophical Library, New York].

Nobel laureate and discoverer of the structure of DNA Francis Crick wrote, “An honest man armed with all the knowledge available to us now, could only state that in some sense, the origin of life appears at the moment to be almost a miracle, so many are the conditions which would have had to have been satisfied to get it going.” [Francis Crick.1981. *Life Itself*]

The purpose of this article and next month’s issue is to illuminate one of the most important theories concerning

The Trinity in Creation and the Role of the Logos

May CSF Presentation
Robert E. Walsh

The up and coming May CSF meeting promises to be a fascinating and “theologically rich” presentation on the “**The Trinity in Creation and the Role of the Logos**”. In his talk, CSF’s Robert (Bob) Walsh will define what we mean by Trinity and establish the role that Each Member played in “creating” Creation. The second major topic to be discussed is the identity of the Logos (the Ancient of Days) and the Role He played in Creation. This discussion will detail the necessary “manifestation” (or generation) of the Logos “prior” to creating creation.

To have a proper understanding of the great Doctrine of Creation it is necessary to understand how the Trinity thought about, planned, and actually brought Creation to fruition.

Ancillary topics to be discussed include the Doctrines of “Ex-Deo” and “Ex-Nihilo” Creation along with the perversion of the former called “Pantheism”. It will be shown that the Doctrine of “Ex-Nihilo” is actually a wonderful corollary to the greater Biblical Doctrine of “Ex-Deo” Creation. All these terms will be defined and discussed.

Don’t miss this up and coming session on a topic that is rarely taught these days.

the origin of life. Two types of living cells exist; prokaryotes and eukaryotes. The prokaryotes are bacteria. All other life forms are classified as eukaryotes. The major difference is that prokaryotes do not contain any of the internal organelles composed of phospholipid membranes. These internal membranes form such organelles as the nuclear membrane, golgi apparatus, chloroplasts and mitochondria. Prokaryotes do not have any of those organelles and are considered by most people as “simple life”. The inference is; the simpler prokaryotes evolved into the more complex eukaryotes. But where did the complex organelles like mitochondria and chloroplasts come from?

Chloroplasts are the organelles that harvest the light energy from the sun and provide chemical energy for most living systems on earth. In other words; without chloroplasts life on Earth would run out of energy, and by the way, the oxygen as well. Mitochondria are the organelles that cause respiration to take place. The fuel for all living organisms is a chemical called ATP [adenosine triphosphate]. Respiration that takes place at mitochondria produces almost all ATP. So the origins of mitochondria and chloroplasts are important to biologists.

The “Endosymbiotic Theory” for the origin of eukaryotic cells was developed in 1967 by Lynn Margulis from Boston University. The endosymbiosis theory postulates that:

- 1 The mitochondria of eukaryotes evolved from aerobic bacteria living within their host cell.**
- 2 The chloroplasts of eukaryotes evolved from endosymbiotic cyanobacteria (autotrophic prokaryotes).**
- 3 Eukaryotic cilia and flagella may have arisen from endosymbiotic spirochetes. The basal bodies from which eukaryotic cilia and flagella develop would have been able to create the mitotic spindle and thus made mitosis possible.**

What kind of evidence is **proposed** to support the hypothesis that mitochondria and chloroplasts arose from bacteria?

- 1 Both mitochondria and chloroplasts can arise only from preexisting mitochondria and chloroplasts. The rest of the story is; they cannot be formed in a cell that lacks them because nuclear genes encode only some of the proteins of which they are made.**
- 2 Both mitochondria and chloroplasts have their own genomes and they resemble that of prokaryotes not that of the nuclear genome. Both genomes consist of circular molecules of DNA. There are no histones associated with the DNA.**
- 3 Both mitochondria and chloroplasts have their own protein-synthesizing machinery, and it resembles that of prokaryotes not that found in the cytoplasm of eukaryotes.**
- 4 Mitochondria and bacteria are similar in size.**

What is known about the Mitochondrial Genome?

A report appeared in the April 9, 1981 issue of the British scientific journal *Nature*, “Sequence and organization of the human mitochondrial genome”. The following is part of the abstract of that paper:

The complete sequence of the 16,569-base pair human mitochondrial genome is presented. The genes for the 12S and 16S rRNAs, 22 tRNAs, cytochrome c oxidase subunits I, II and III, ATPase subunit 6, cytochrome b and eight other predicted protein coding genes have been located. The sequence shows extreme economy in that the genes have none or only a few noncoding bases between them, and in many cases the termination codons are not coded in the DNA but are created post-transcriptionally by polyadenylation of the mRNAs. [*Nature* 1981 Apr 9;290 (5806):457-65]

The Mitochondrial Genome

The genome of human mitochondria contains 16,569 base pairs of DNA organized in a closed circle and encode 37 genes:

- 2 ribosomal RNA (rRNA) molecules
- 22 transfer RNA (tRNA) molecules (shown in the figure as yellow bars; two of them labeled)
- 13 polypeptides
- **The 13 polypeptides participate in building several protein complexes embedded in the inner mitochondrial membrane.**
- **7 subunits that make up the mitochondrial NADH dehydrogenase**
- **3 subunits of cytochrome c oxidase**
- **2 subunits of ATP synthase**
- **cytochrome b**

These 13 proteins are vital to the production of ATP by the mitochondria.

It has been said that there is:

“simple” life and “complex” life and “simple life” evolved into “complex life”.

How simple is the simplest life today ?

Most biologists would agree that bacteria are the least complex form of living organisms. Let us observe the composition of the common *Escherichia coli* cells.

Components of *Escherichia coli* Cells

Component	Percent of Weight	Molecules Per Cell	Number of Different Kinds of Molecules
Water	70	24.3 billion	1
Proteins	15	2.4 million	approx. 4,000
Nucleic acids	7	255 thousand	660
Polysaccharides	3	1.4 million	3
Lipids	2	22 million	50-100
Metabolic Intermediates	2	many millions	800
Minerals	1	many millions	10-30

Javor, 1998

It took a team of 40 scientists to achieve the sequencing of the whole of the genome of the bacterium *Haemophilus influenzae*. This was the first free-living bacterium to be fully sequenced and it was considered 'typical among bacteria'. The resulting genome has 1,830,137 base pairs coding for an estimated 1,743 genes. *Mycoplasma genitalium* is a Gram-positive parasitic bacterium. The urogenital tract may be its primary infection site and it probably causes non-gonococcal urethritis. Mycoplasmas are the smallest known organisms capable of growth and reproduction outside living host cells. The total base pairs is 580,074 and code for 480 proteins. This sequence was completed Jan 8, 2001.

Like all mycoplasmas, *M.genitalium* lacks a cell wall, has a very small genome. *M. genitalium* in particular has the smallest genome of known cellular organisms capable of independent replication.

Distribution of Genes by Their Functions in Three Bacterial Cells

Function	<i>H. influenzae</i>	<i>U. genitalium</i>	<i>E. coli</i>
Amino acid metabolism	68	1	131
Biosynthesis of cofactors, prosthetic groups and carriers	54	5	103
Cell envelope	84	17	195
Cellular processes	53	21	188
Central intermediary metabolism	188	30	6
Energy metabolism	105	31	243
Fatty acid and phospholipid metabolism	26	6	48
Purines, pyrimidines, nucleosides and nucleotides	58	53	19
Regulatory functions	64	7	45
Replication	87	32	115
Transcription	27	12	55
Translation	141	101	182

From this table it is seen that *E. coli* requires more than 1500 different proteins for growth. Most of these proteins are biocatalysts "enzymes" that promote specific chemical conversions.

Javor. 1998

It would be pure speculation to believe that a less complex form of life could survive.



ICC 2003

When: August 4 – 9, 2003

Where: Geneva College, Beaver Falls, PA

Web Site: www.icc03.org

The ICC committees have been working hard the past few months to put together what is shaping up to be an exciting conference.

So far there are 12 sessions planned for the Basic Track, 42 sessions for the technical track and the evening programs that will include the Gateway Clipper Dinner Cruise. You should have received the conference brochure with registration information in the last issue of the newsletter.

A sample of the Basic and Technical Track sessions are listed on the next page.

This is your chance to meet researchers from around the world who are at the forefront in the development of the Creation Model.

ICC 2003 Basic Track Sessions

Biblical Hermenutics	Noah's Flood
Fossil Man	Limits of Biological Change
Days of Genesis	Psychology, Creation Style
Creation Astronomy	The Geologic Column / Grand Canyon
Radioisotopic Dating	Catastrophic Plate Tectonics
Bariminology	Icons of Evolution

ICC 2003 Technical Track Sessions

Accelerated Decay: Theoretical Models	Hypercanes Following the Genesis Flood
Temperature Profiles for an Optimized Water Vapor Canopy	The Ubiquity of the Divine (Golden) Ratio and Fibonacci Numbers Throughout the Heavens and Earth
Effects of a YEC Apologetics Class on Student Worldview	Origin of Chemical Elements from Water
Catastrophic Plate Tectonics: The Physics Behind the Genesis Flood	Measurable ¹⁴ C in Fossilized Organic Materials: Confirming the Young Earth Creation-Flood Model
Perspectives on Ageing:	What Initiated the Flood Cataclysm?
Will Mechanics Allow a Rapid Ice Age Following the Flood?	Helium Diffusion Rates Support Accelerated Nuclear Decay
Paleohydrology of Jurassic Conglomerate of the Crimean Peninsula	The Oklo "Natural Nuclear Reactors" - Evidence of Variable Constants?
Evidence for Only One Gigantic Lake Missoula Flood	A Hydrothermal Model of Rapid Post-Flood Karsting
Radiohalos – A Tale of Three Granitic Plutons	Flow Dynamics of an Enormous Subaqueous Dune within the Anchor Limestone
Radioisotopes and the Age of the Earth	Initial Flood Deposits of the Western North American Cordillera: California
Hydrothermal Biome: A Pre-Flood Environment	The Pre-Flood Floating Forest: A Study in Paleontological Pattern Recognition
Hebrew and Geologic Analysis of the Chronology and Parallelism of the Flood: Implications for Interpretation of the Geologic Record	Early 19th Century British "Scriptural Geologists": Opponents of the Emerging Old-Earth Theories of Geology
The Genre of Genesis One	Septuagintal Versus Masoretic Chronology in Genesis 5 and 11
The Organosubstrate of Life: A Creationist Perspective of Microbes and Viruses	Do Creation and Flood Myths Found World Wide Have a Common Origin?
Pain and Adam Bomb	Rafting: A Post-Flood Biogeographic Dispersal Mechanism

2003 CSF Meeting Topics

Tuesday, April 15 "Creationist Response to the PBS Series on Evolution",
Dennis Wert

Tuesday, May 20 "The Trinity as Seen in Creation", Bob Walsh

No Meetings for June / July/ August

**Aug 4-9, International Conference on Creationism. Held at
Geneva College**

Tuesday, Sept. 16 "Highlights and An Overview of the 2003 ICC", Lionel Dah-
mer and Reid Moon

Tuesday, Oct. 21 "What is Relevance of the Biblical Creation Account to YOUR
Christian Faith", Reid Moon

Nov 18 "Neo-Creationist Geology from 2003 ICC", Chuck Danley

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