

# Existence of Extra Terrestrial Life

Introduction .....	2
Is there anybody out there? .....	3
Life's Raw Materials May Have Come From The Stars .....	5
Scientists Claim Evidence of Life in Outer Space .....	6
Discussions around Theories of Origin of life .....	8
Panspermia Theory.....	9
Evidence for Panspermia.....	9
Different Scenarios of Panspermia.....	9
The Primordial Soup Theory.....	11
Problems with theory .....	11
The Superbugs Theory .....	13
“Selfish” RNA theory.....	15
Other theories .....	16
Creationism .....	17
Other evidence.....	17
End Quotes .....	18

## **Introduction**

We need to understand origin of life on earth first of all before discarding the possibilities for Extra Terrestrial life to exist.

Scientists try to build support or disapprove theories put forward for origin of life on earth. In addition on the other spectrum of science, scientists try to find evidence of life forms in meteorites and asteroids found on earth.

The convergence of ideas from both these sides of science can maybe give us some clues to how life came around on earth, as well as prove or disapprove that there can exist life forms outside the earth, in space somewhere.

Determinism states that Life is inevitable and other planets contain life. Can this be the fact and how can we prove this?

I have collected some articles from various sources in this article, and I end this article with a discussion of various theories of origin of life. Then I will leave it to the reader to judge and to make his/hers opinion to how life began at earth, and to make a statement, whether there are life forms in space somewhere or not. This article was not meant to give all the answers, but to trigger the interest of the reader to do further investigations and/or feedback on this article to spur some discussions around the topic – Extra Terrestrial Life – Does it exist and in case it exists – where?

My opinion is that there is a chance for extra terrestrial life forms and I believe life on earth started through introduction of extra terrestrial matter from outer space at one given time, billions of years ago, and that this would have occurred other places in our universe as well, maybe not at the exact same time as on earth, and maybe not under the exact same conditions, but organic matter is bound to exist other places in our universe, as I do not believe in a singular point theory for creation of life in universe. Conditions, as seen on earth through it evolution through billions of years should be possible to exist other places. As the universe is to big an available space to disregard the probability of these conditions to have existed at several locations in the available space through the creation of the universe, and that is not limited to only to our solar system.

Stig-Arne Kristoffersen

## Is there anybody out there?

**Probably not, according to a scientist from the University of East Anglia. A mathematical model produced by Prof Andrew Watson suggests that the odds of finding new life on other Earth-like planets are low, given the time it has taken for beings such as humans to evolve and the remaining life span of Earth.**

*ScienceDaily (Apr. 19, 2008) —*

Structurally complex and intelligent life evolved late on Earth and it has already been suggested that this process might be governed by a small number of very difficult evolutionary steps.

Prof Watson, from the School of Environmental Sciences, takes this idea further by looking at the probability of each of these critical steps occurring in relation to the life span of Earth, giving an improved mathematical model for the evolution of intelligent life.

According to Prof Watson a limit to evolution is the habitability of Earth, and any other Earth-like planets, which will end as the sun brightens. Solar models predict that the brightness of the sun is increasing, while temperature models suggest that because of this the future life span of Earth will be 'only' about another billion years, a short time compared to the four billion years since life first appeared on the planet.

"The Earth's biosphere is now in its old age and this has implications for our understanding of the likelihood of complex life and intelligence arising on any given planet," said Prof Watson.

"At present, Earth is the only example we have of a planet with life. If we learned the planet would be habitable for a set period and that we had evolved early in this period, then even with a sample of one, we'd suspect that evolution from simple to complex and intelligent life was quite likely to occur. By contrast, we now believe that we evolved late in the habitable period, and this suggests that our evolution is rather unlikely. In fact, the timing of events is consistent with it being very rare indeed."

Prof Watson suggests the number of evolutionary steps needed to create intelligent life, in the case of humans, is four. These probably include the emergence of single-celled bacteria, complex cells, specialized cells allowing complex life forms, and intelligent life with an established language.

"Complex life is separated from the simplest life forms by several very unlikely steps and therefore will be much less common. Intelligence is one step further, so it is much less common still," said Prof Watson.

His model, published in the journal *Astrobiology*, suggests an upper limit for the probability of each step occurring is 10 per cent or less, so the chances of intelligent life emerging is low – less than 0.01 per cent over four billion years. Each step is independent of the other and can only take place after the previous steps in the sequence have occurred. They tend to be evenly spaced through

Earth's history and this is consistent with some of the major transitions identified in the evolution of life on Earth.

## **Life's Raw Materials May Have Come From The Stars**

**Scientists have confirmed for the first time that an important component of early genetic material which has been found in meteorite fragments is extraterrestrial in origin, in a paper published on 15 June 2008.**

*ScienceDaily (June 13, 2008)*

The finding suggests that parts of the raw materials to make the first molecules of DNA and RNA may have come from the stars.

The scientists, from Europe and the USA, say that their research provides evidence that life's raw materials came from sources beyond the Earth.

The materials they have found include the molecules uracil and xanthine, which are precursors to the molecules that make up DNA and RNA, and are known as nucleobases.

The team discovered the molecules in rock fragments of the Murchison meteorite, which crashed in Australia in 1969.

They tested the meteorite material to determine whether the molecules came from the solar system or were a result of contamination when the meteorite landed on Earth.

The analysis shows that the nucleobases contain a heavy form of carbon which could only have been formed in space. Materials formed on Earth consist of a lighter variety of carbon.

Lead author Dr Zita Martins, of the Department of Earth Science and Engineering at Imperial College London, says that the research may provide another piece of evidence explaining the evolution of early life. She says:

"We believe early life may have adopted nucleobases from meteoritic fragments for use in genetic coding which enabled them to pass on their successful features to subsequent generations."

Between 3.8 to 4.5 billion years ago large numbers of rocks similar to the Murchison meteorite rained down on Earth at the time when primitive life was forming. The heavy bombardment would have dropped large amounts of meteorite material to the surface on planets like Earth and Mars.

Co-author Professor Mark Sephton, also of Imperial's Department of Earth Science and Engineering, believes this research is an important step in understanding how early life might have evolved. He added:

"Because meteorites represent left over materials from the formation of the solar system, the key components for life -- including nucleobases -- could be widespread in the cosmos. As more and more of life's raw materials are discovered in objects from space, the possibility of life springing forth wherever the right chemistry is present becomes more likely."

## Scientists Claim Evidence of Life in Outer Space

Reuters, 31 July 2001

A team of international researchers said on Tuesday they have found what could be the first proof of life beyond our planet -- clumps of extraterrestrial bacteria in the Earth's upper atmosphere.

Although the bugs from space are similar to bacteria on Earth, the scientists said the living cells found in samples of air from the edge of the planet's atmosphere are too far away to have come from Earth.

"There is now unambiguous evidence for the presence of clumps of living cells in air samples from as high 41 kilometers (25 miles), well above the local tropopause (16 kilometers up), above which no air from lower down would normally be transported," Professor Chandra Wickramasinghe, an astronomer at Cardiff University in Wales, said in a statement.

He presented the findings to a meeting of the International Society of Optical Engineering in San Diego, California.

"A prima facie case for a space incidence of bacteria on to the Earth may have been established," the statement said.

Wickramasinghe and scientists from India collected the space bugs from samples of stratospheric air using the Indian Space Research Organization's cryogenic sampler payload flown on balloons from a launch pad in Hyderabad, southern India.

Using a fluorescent dye the scientists detected living cells in the sample and estimated by the way their distribution varied with height that they are falling from space.

As much as a third of a ton of the biological material is raining down over the entire planet daily, by their estimation.

Professor David Lloyd, a microbiologist at Cardiff University who examined the space bugs and co-authored the report, said they look like common terrestrial bacteria but there is no explanation of how they could have risen so high.

"There would have to be some unusual event which would take particles from the Earth to a height of 40 kilometers," Lloyd said in a telephone interview.

The bacteria could have hitched a ride on a rocket or satellite into space or they really could be from another planet.

"We have no evidence for one or the other as yet," said Lloyd. "The most likely possibility is that the bacteria have arrived from another planet. I'd like to think that, at any rate."

Lloyd has tried, so far unsuccessfully, to grow the bacteria in culture but said he hasn't found the right conditions yet.

“It's the first pointer that it is possible to get evidence that there is life on other planets,” he added.

Wickramasinghe is convinced the space bugs provide strong support for the panspermia theory -- which suggests that life may have come from outer space in the form of germs or spores.

“We have argued for more than two decades that terrestrial life was brought down to Earth by comets and that cometary material containing micro-organisms must still reach us in large quantities,” he said.

## Discussions around Theories of Origin of life

There are several Theories of how life came around on earth. The mysteries of origin of life have been in minds of the scientists for as long as science has been around.

Several theories have been put forward, and several experiments have been carried out in order to prove a theory or create holes in its theorems.

There are many chicken and the egg paradoxes involved in the origin of life. One of them is which came first, protein or the cell. Cells Make protein, but proteins are the building blocks of cells. Another is whether DNA/RNA or proteins came first. DNA/RNA code for proteins, but in order to make DNA/RNA (and proteins), you need enzyme (= proteins).

There has been evidence that there was a African Eve / Mitochondrial Eve. Because of similarities of DNA of mitochondria of all humans, which is inherited through mother, humans all came from a single human female.

The implications of all these theories/beliefs are:

1. There is a God who is the Devine Creator ?
2. Life is inevitable and other planets contain life (determinism) ?
  - a. Mind is matter
  - b. Matter is widespread
  - c. Life is widespread (in universe)
  - d. Life is inevitable
  - e. Not random
3. Life on Earth was an accident and life exists nowhere else
  - a. Life is an accident
  - b. Happen by freakish chance

## ***Panspermia Theory***

Suggests that life seeds came from outer space and planets exchanged life. Panspermia literally means seeds everywhere.

Panspermia suggests that life could have existed on another planet and moved to Earth. Statistics have showed 7.5% of rocks from Mars reach Earth. The rocks would travel between less than 100 years to 16,000 years and more to get to earth.

Some of the proponents include Sales Gyon de Montlivant, who proposed life came from moon, H.E. Richter, who suggested life came from meteorites/comets, and Svante Arrhenius, who came up with Panspermia.

### **Evidence for Panspermia**

1. Bacteria can survive harsh environment of space
  - a. Ultraviolet radiation
  - b. Protons bombardments
  - c. Cold
2. Evidence that meteorites contain life
  - a. Amino acids (left handed in helicity)
  - b. Bacteria
  - c. Carbon
  - d. Protected inside rocks
3. Bacteria can live for a long time in sleeping state until awakened
4. Mars safer than Earth (less bombardments and less gravity)
5. Mars not as hot as Earth in early development
6. Mars had have had oxygen back then when earth did not

### **Different Scenarios of Panspermia**

Life began once, on Mars, and came to Earth in Martian meteorites. May or may not still exist on Mars (amino acids or bacteria)

Life originated on both Earth and Mars independently. Cross-colonization (cross-fertilization) may subsequently have occurred (a.a. or bacteria)

Life began once, on Earth, and was propagated to Mars, where it possibly established itself (a.a. or bacteria)

Life originated on both Earth and Mars, but in spite of the exchange of rocks and dust, no transfer of viable organisms has occurred

Life originated on neither Earth nor Mars, but somewhere else entirely, such as a comet, Jupiter's moon Europa, Venus, or body outside the Solar System altogether. It came to earth, perhaps Mars too, via some sort of Panspermia mechanism (a.a. or bacteria)

Life has originated on earth alone and has not (yet) successfully colonized another planet. Mars is, and always was,

Scientists say that the odds of producing the right proteins by chance are something like  $10^{40,000}$ . This can be compared to a whirlwind sweeping through a junkyard and producing a fully-functional Boeing 747.

## ***The Primordial Soup Theory***

Suggest that life began in a pond or ocean as a result of the combination of chemicals from the atmosphere and some form of energy to make amino acids, the building blocks of proteins, which would then evolve into all the species.

The Primordial Soup Theory states that Life began in a warm pond/ocean from a combination of chemicals that forms amino acids, which then make proteins. This is suppose to happen at least 3.8 billion to 3.55 billion years ago.

The Russian Chemist A.I. Oparin and English Geneticist J.B.S. Haldane first conceived of this idea. Both developed this theory independently in 1920.

In this theory, the basic building blocks of life came from simple molecule which formed in the atmosphere (w/o oxygen). This was then energized by lightning and the rain from the atmosphere created the "organic soup". The first organisms would have to be simple heterotrophs in order to survive by consuming other organisms for energy before means of photosynthesis. They would become autotrophs by mutation. Evidence now suggest the first organisms were autotrophs

Chemist Stanley Miller and physicist Harold Urey did a famous experiment in 1950 to test this theory. They mixed gases thought to be present on primitive earth:

- Methane (CH<sub>4</sub>)
- Ammonia (NH<sub>3</sub>)
- Water (H<sub>2</sub>O)
- Hydrogen (H<sub>2</sub>)
- No Oxygen

They then electrically sparked the mixture to signify lightning. The results were amino acids, the building blocks of proteins. It was later discovered that other energies also can excite gases and produce all 20 amino acids:

- Electricity
- Ultraviolet light
- Heat
- Shock

### **Problems with theory**

1. Amino acids have to become protein
  - a. 1 protein = 100amino acids of 20 varieties

- b.  $10^{130}$  combinations of amino acids
  - c. Hard to hit the right protein by accident
  - d. Amino acids are building blocks, not the assembled structure
2. Early atmosphere contain different gases than those used by Miller/Urey
- a. No ammonia and methane
  - b. Not reduced (opposite of oxidized)
  - c. Experiments with true atmospheric gases did not produce abundant amino acids
3. 2<sup>nd</sup> Law of Thermodynamics
- a. System becomes less and less organized over time
  - b. Means amino acids cannot form protein spontaneously (more and more organized)
4. Primordial soup too dilute to achieve anything
- a. Cannot spontaneously generate proteins
  - b. No mechanism to concentrate and make protein

This theory emphasize metabolism because of the cooperative group of molecules and how they gain and use energy and molecules.

In an experiment by Sidney Fox, heated amino acids drove out water as steam and made peptide chains. They were Proteinoids though, very different from real proteins.

## ***The Superbugs Theory***

Suggest that, because of the discovery of a vast amount extremophiles underground, life may have originated safely underground as tiny microbes in the extreme environment. Chicago geologist Edson Baston first proposed this theory in 1920

Superbugs can live in extreme conditions. They could exist as the following:

- Thermophiles (heat lovers)
- Halophiles (salt lovers)
- Methanogens (make methane)

They are considered to be chemotrophs (chemosynthetic/chemosynthesis) because they got their energy from chemicals. These superbugs can live 4 km (2.5 mi) underground and 7 km (4.3 mi) below ocean floor. They can sustain temperature up to 170° C (338° F).

The populations of superbugs are more than 1 billion per cubic centimeter at the surface and about 10 million deep down. They increases at deeper depths.

Advantages for Superbugs theory

1. Micro-organisms underground are not affected by the bombardment of earth on the surface
2. No ultraviolet radiation when underground
3. No dust from volcanoes underground
4. No climatic variations underground
5. More raw materials necessary for life (reducing gases)
  - a. Hydrogen
  - b. Methane
  - c. Ammonia
  - d. Hydrogen Sulfide
  - e. Other minerals
6. Energy available underground

- a. Maximized @ 100° to 150° C
- b. Gain energy from fabricating compounds
- 7. The archaea has evolved the least, meaning earliest form of life
- 8. Subsurface has changed far less than surface (same primitive organisms)
- 9. Microbes can make energy from chemicals (Chemotrophs)

Microbes are believed to have risen from ground and adapted as surface dwellers.

## ***“Selfish” RNA theory***

Suggests life could have started as RNA molecules, because of RNA’s various abilities, which existed only to reproduce and evolve.

One of the reasons scientists came up with this theory is that DNA only store information and is stronger and more evolved than RNA. RNA's job is to pass information and catalyze.

The first RNAs are suppose to be short sequence of nucleotide bases that performed many actions and jobs. They reproduced for survival at a fast pace. Bacterium can reproduce in 20 minutes and RNA probably reproduced in seconds.

This theory emphasizes reproduction and evolution. RNA got its energy from environment.

The of RNA's catalyst abilities:

1. DNA → RNA → Proteins (Now)
2. Proteins → RNA → DNA (Beginning?)

In an experiment, Spiegelman found the RNA’s that multiplied the fastest survived the best, and he also found that RNA can synthesize from building blocks.

## ***Other theories***

Some have suggested the origin of life is a mix of these ideas, while others believe an entirely different idea, and there are those who think new natural laws are needed.

Directed Panspermia is the idea that other alien forms within the universe brought life to earth in a spaceship. This is very unlikely.

Another idea is that other life forms within the universe created life. This is also very unlikely.

Yet another possibility is that new natural laws are needed. Maybe there are laws that science has not discovered yet. People speculate that life may be using some unknown law.

All these are theories, and there are many more out there. It is up to the reader as to which one he/she believes.

## **Creationism**

Is the idea that a Creator, God, created life according to its kind (as in the Bible), and life has evolved and changed but not enough to create new species. God created Earth and everything in it (including life) in a six-day period around 4,000 or 8,000 B.C.

- 1<sup>st</sup> day – Monday – Morning and evening
- 2<sup>nd</sup> day – Tuesday – Sky
- 3<sup>rd</sup> day – Wednesday – Land, seas, and vegetation according to its kind
- 4<sup>th</sup> day – Thursday – Sun, moon, and stars
- 5<sup>th</sup> day – Friday – Sea and sky animals, each according to its kind
- 6<sup>th</sup> day – Saturday – Land animals and man, each according to its kind
- 7<sup>th</sup> day – Sunday – Rest

Each organism is created according to its kind by God. Variations can exist within a kind. Humans produce humans, cows produce cows is an example of how each is created according to its kind.

Mutation and natural selection could not by themselves have brought all living things from a single organism. Neither can create information out of nothing or pure randomness (evolution). Organisms can only have the same information or lose it, not gain it. On the other hand, evolutionists believe that organisms gain more and more information (complexity) in mutation and natural selection. Gaps in fossil records also support Creation. Animals appear abruptly and there are no clear links.

Noah's Flood is used to explain the fossil record. Quick fossilization in Catastrophism would create fossils. The Global flood could made fossils by catastrophic processes. This accounts for fossil records in geology and there is evidence of a global flood.

### **Other evidence**

1. Birds are specialized
  - a. Wings and lungs not from reptiles
  - b. Created especially for its purpose
  - c. Advanced and could not have evolved
2. DNA are composed of same building blocks in all organisms
  - a. Evolutionists say from same ancestor

b. Creationists – same special Creator – designed using same building blocks for efficiency

3. Complexity of living organisms

a. Designer

b. In SETI, complex radio signals = designer

c. Complex organisms = designer

4. Problems with Big Bang and Chaos Theories

5. Problems with dating methods

a. Radiometric dating

b. Radioactive dating

c. Radiocarbon dating

d. Unstable and incorrect each time

e. 90% of dating methods indicate far younger Earth

Although evolution (the theory) is said to be accepted by most scientists, there are many problems and gaps with the theory (even evolutionists admit it), and many scientists are not evolutionists (creationists or not)

## End Quotes

***C.S. Lewis – If the existence of life is an accident, then the evolution of man was also an accident, and everything that we have achieved are accidents, and our thoughts are accidental byproducts of the movement of atoms. Meaning why should we believe these accidental accounts of accidents?***

***Albert Einstein – “Science without religion is lame, religion without science is blind.”***