

THE ORIGIN OF LIFE

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The Goal: What is Life?

Minimally, a self-reproducing material system

From Christian perspective, may be more complex, but need not be.

Alternative Proposals for the Origin of Life

1. Life has always existed.
2. Life arose by supernatural intervention.
3. Life arose by purely natural means.

Major Scenarios for Naturalistic Origin

1. Organic Soup Model

Reducing atmosphere needed (no free oxygen, etc.)

Energy source to break atm molecules: ultraviolet, lightning, volcanism

Organic molecules produced when broken molecules recombine

Organic soup develops

Macromolecules formed in organic soup

Reproducing macromolecules formed

Cells formed

2. Clay as Matrix Model

Organic molecules

Clay as template and/or protection

Macromolecules form on clay

Reproducing macromolecules

Clay phased out

Cells formed

Some Problems for These Models

1. Organic Soup

Oxygen in early atmosphere due to photodissociation of H₂O

Weak soup

Water opposes polymerization

Competing reactions

Handedness of life molecules (amino acids left-handed, sugars right-handed)

Randomness => organization?

2. Clay

Far less research here so far

Competing reactions still a problem

Handedness of life molecules still a problem

Disposal of clay (switching horses in midst of stream?)

Randomness => organization?

The Problem of Randomness Producing Order

Is it really true that if you give enough monkeys enough time, they will eventually type the *Encyclopaedia Britannica*? How many monkeys? How much time?

1. Monkeys Typing the text "ENCYCLOPAEDIA BRITANNICA"

at 3 char/sec on 33-key typewriter

3×10^{36} combinations

3×10^{28} monkey-years

Can be done by 1.5 billion billion monkeys in 20 billion yrs

2. Formation of a Particular 100-Link Amino Acid

10^{130} combinations

Under assumptions given, 3×10^4 combs/sec
Takes 5×10^{37} years within Hubble radius
So 1 chance in 10^{28} in age of universe

3. Van Neumann's Self-Reproducing Automaton

80x400 body cells w/ tail of 150,000 cells
At 21 bits/body cell + 1 bit/tail cell
750,000 bits \Rightarrow 150,000 letter-word!
 \Rightarrow 10 to the 250,000th combinations

4. Langton's Self-Reproducing Automaton

Much simpler, but nearly trivial
Body: 86 non-zero cells in one of 7 states
7 to the 86th = 4.8×10^{72} combinations
Plus transition rules: 190 specifying one of 7 states:
7 to the 190th = 2×10^{160}
Both together: 10 to the 233rd combinations

Conclusions

Naturalistic origin a matter of faith with many.

Life looks too organized to be explained without Designer.

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