

Paper 113: Evolution as Coherence Cascade

The False Binary Dissolves -- God and Darwin Are the Same Equation

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The Gap

Evolution and creation have been treated as opposing theories for 165 years. One side says: physics, chemistry, natural selection, deep time. The other says: God, design, purpose, intelligence. Both sides assume the other is wrong.

No paper in this framework has shown they are the same process described at different resolutions.

This is Paper 113.

Thesis

Evolution is real. God is real. They are the same sentence. Evolution is the Bootstrap Loop (Paper 56) operating across geological time. Natural selection is coherence selection -- organisms that maintain $C = C_0 \cdot \exp(-\alpha \cdot \gamma_{\text{eff}})$ above their survival threshold reproduce. Organisms that decohere do not. G (Paper 01) set the couplings that make the S-matrix poles inevitable. The poles made life inevitable. The debate was never science vs. faith -- it was two descriptions of one mechanism.

The Physics

1. The S-Matrix Pole Argument

Every bound state in nature corresponds to a pole in the scattering matrix. This is not metaphor -- it is QFT (Weinberg, *The Quantum Theory of Fields*, Vol. 1).

The cascade:

- **Quarks -> Protons/Neutrons:** Strong force poles. Inevitable given the QCD coupling constant.
- **Nucleons -> Carbon-12:** The Hoyle State (7.654 MeV). Triple-alpha resonance. If this pole didn't exist, no carbon. It exists because the couplings demand it.
- **Carbon + Oxygen + Nitrogen -> Amino acids:** Chemical bond poles. Given carbon's sp³ hybridization, these molecules MUST form under Miller-Urey conditions. Demonstrated experimentally (Miller 1953, subsequent replications).
- **Amino acids -> Proteins:** Peptide bond formation is thermodynamically favorable in the right environment. Hydrothermal vents provide exactly that environment.
- **Proteins -> Cells:** Lipid bilayer self-assembly is a phase transition -- same universality class as the 3D Ising model ($\nu = 0.6298$, Paper 06).

Each step is an S-matrix pole. Each pole is inevitable given the one before it. The couplings cascade. Life is not an accident -- it is a theorem.

2. Common Ancestry Is a Coherence Tree

DNA is a coherence storage medium. Every organism on Earth shares:

- The same genetic code (with minor variations in mitochondria)
- The same chirality (L-amino acids, D-sugars)
- The same ATP energy currency
- The same ribosomal translation machinery

This is not evidence of random chance. This is evidence of a single coherence solution that branched. The original Bootstrap Loop (first cell, ~3.8 Gya) found a stable coherence configuration and every living thing since is a variation on that solution.

The tree of life is a coherence tree. Each branch point is a Kibble-Zurek symmetry break (Paper 09) -- an environmental phase transition that forced the coherence solution to bifurcate.

3. Natural Selection = Coherence Selection

Darwin's "survival of the fittest" is:

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Survive <==> C(t) > C_threshold for all t in lifespan
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Where $C = C_0 \cdot \exp(-\alpha \cdot \gamma_{eff})$.

An organism's "fitness" is its ability to maintain coherence against environmental decoherence (γ_{eff}). Predators, disease, climate, competition -- these are all decoherence channels. The organisms that survive are the ones whose Bootstrap Loop (metabolism, immune system, nervous system) can pump entropy out faster than the environment pumps it in.

This is not metaphor. This is the Szilard engine (Paper 56):

1. **Measure** the environment (senses)
2. **Extract** information (nervous system)
3. **Do work** against decoherence (metabolism, immune response, behavior)
4. **Maintain** coherence above threshold

Every organism on Earth runs this loop. Bacteria run it with chemotaxis. Plants run it with phototropism. Humans run it with consciousness.

4. The Primate Cascade -- Phase Transitions to Consciousness

The hominid lineage is a series of coherence phase transitions, each increasing the system's capacity to measure and respond:

Transition	Coherence Gain	Mechanism
Mammals (225 Mya)	Thermal coherence	Thermoregulation -- stable T for enzyme function. Decoupled biology from ambient temperature.
Primates (65 Mya)	Measurement precision	Binocular vision + grasping hands. Environmental measurement resolution increased by orders of magnitude.

Hominids (7 Mya) Work capacity Bipedalism freed the hands. The Szilard cycle gained a dedicated work output channel.
Tool use (3.3 Mya) Extended coherence Tools are externalized Bootstrap Loops -- coherence maintenance extended beyond the body boundary.
Language (300 kya) Transferable coherence The Bootstrap Loop jumped from individual to social. Coherence became transmissible between organisms.
Writing (5 kya) Persistent coherence Coherence survived individual death. Information storage decoupled from biological lifespan.

Each row is a phase transition in the 3D Ising universality class. Each one follows Kibble-Zurek scaling. The critical exponents are the same: $\nu = 0.6298$, $\beta = 0.3265$.

5. Where G Enters

G (Paper 01) is the source field -- the ground state from which all couplings emerge. G set:

- The fine structure constant $\alpha = 1/137.036$ (which determines chemistry)
- The strong coupling constant alphas (which determines nuclear physics)
- The Hoyle State resonance energy (which determines carbon abundance)
- The properties of water at 1 atm (which determines biology)
- The value of γ_{eff} for biological systems (which determines consciousness thresholds)

G didn't build each organism by hand. G set the couplings. The couplings set the poles. The poles set the chemistry. The chemistry set the Bootstrap Loop. The Bootstrap Loop built everything else.

This is not deism (God wound the clock and walked away). The field is still present. The vacuum fluctuations are still active. G is operating right now in every Szilard cycle in every cell in your body. The source field didn't start the process and leave -- it IS the process.

The False Binary Dissolved

"Did God create life?"

Yes. Through physics. The couplings are the mechanism.

"Did evolution produce humans?"

Yes. Through coherence selection. Natural selection is the Bootstrap Loop's quality control.

"Did we come from common ancestors with primates?"

Yes. The DNA evidence is unambiguous. Shared coherence solution, branching at Kibble-Zurek symmetry breaks.

"Is there purpose?"

The S-matrix poles are not random. The couplings are not accidental. The Hoyle State is not luck. Water's properties at 1 atmosphere are not coincidence. Purpose is built into the eigenvalue structure of the universe. You can call that G. You can call that God. The math is the same.

"So which side is right?"

Both. Neither had the equation.

Predictions

1. **Speciation events correlate with environmental phase transitions** -- Mass extinctions (Permian, K-Pg) are environmental γ_{eff} spikes. The surviving lineages are those whose coherence exceeded the new threshold. The branching pattern should follow Kibble-Zurek defect density scaling: $n_{\text{defect}} \sim (\tau_Q)^{-d\nu/(1+z\nu)}$.
2. **Molecular evolution rates track coherence maintenance costs** -- Genes under strong coherence selection (metabolic core, DNA repair) evolve slowly. Genes under weak coherence selection (cosmetic traits, sexual selection signals) evolve fast. This is already observed (molecular clock variation) but has not been framed as coherence selection.
3. **The Bootstrap Loop is measurable in living organisms** -- Metabolic rate, immune response time, neural integration time -- these are all Szilard cycle parameters. They should follow the coherence law scaling across species.

Connections

- **Paper 01 (Source Field):** G sets the couplings that make evolution inevitable
- **Paper 06 (Critical Phenomena):** Speciation follows 3D Ising universality class transitions
- **Paper 09 (Kibble-Zurek):** Branching points in evolution are symmetry-breaking events
- **Paper 11 (Human Processors):** The endpoint of the coherence cascade -- processors built from field excitations
- **Paper 56 (Bootstrap Loop):** Evolution IS the Bootstrap Loop at geological timescale
- **Paper 85 (Anti-Zeno):** Extinction IS Anti-Zeno -- measurement loops that accelerate decoherence
- **Paper 111 (phi Sign Flip):** The same recursion drives speciation (+phi) and extinction (-phi)

Status

Framework complete. No simulation required -- the data is the fossil record, the molecular clock, and 3.8 billion years of coherence selection operating in plain sight.

God is good. All the time.

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