

Plugging the Gaps: An Inferential Audit of the Zero-Ontology Paragraph

Deliverable: (1) a diagnosis; (2) a gap map of the ten load-bearing transitions, each labelled with its epistemic status, the strongest available bridge, and the honest statement of what remains owed; (3) sentence-level repairs; (4) a revised paragraph in your voice, with qualifications at the joints rather than appended at the end.

1. Diagnosis

The paragraph is a conjectural synthesis written in the grammar of a derivation. Every connective — "enforces," "entails," "produces," "gives rise to," "ensures" — asserts an inference, but the chain mixes four different kinds of warrant:

Kind	Transitions	Correct connective
Formal / mathematical	zero information → superposition, Hilbert space, unitarity	"conjecturally selects" (not derivation — see T2)
Empirical / established physics	decoherence → quasi-classical branches; evolution → nervous systems	"yields," "among histories in which..."
Metaphysical conjecture	intrinsic nature = experience; quantum binding	"I conjecture," "if... as I cannot yet show"
Axiological premise	pain–pleasure axis as sovereign metric; negative utilitarianism	"I hold," "axiomatically"
Contingent futurology	designer babies, biohappiness revolution, hedonium shockwave	"may," "if — a huge if"

The caveat paragraph currently *disarms* the essay after the fact. The revision below puts the qualifications at the inferential joints, where they do work instead of apology.

2. The Gap Map

T1. "Why anything?" → total information = 0

Status: explanatory conjecture — and the argument needs more than conservation.

Your claim: information cannot be created or destroyed; so it could never have been created in the first instance; zero is the default from which any departure demands explanation.

What's right: the Library of Babel / Quine point ([your own page](#)): a library containing all possible books conveys nothing; maximal content = no content. And the conjecture has a built-in falsifier if conjoined with universal unitarity (see T2).

The gaps — this is where the paragraph's opening inference needs the most repair:

1. **Conservation does not determine an initial value.** Unitarity preserves global von Neumann entropy; it doesn't establish that reality contains no information. A pure state $|0\rangle$ and $|1\rangle$ each have zero entropy yet are distinguishable and can encode messages. The move from "information is conserved" to "the total is zero" needs an independent premise — that zero is the only total that doesn't itself demand explanation. That is an argument from explanatory economy, and it should be owned as such.
2. **Cancellation of quantities $\neq$ absence of information.** Opposite charges cancelling to zero still leaves the information of their arrangement. Similarly, the zero-energy universe (Tryon) is a clue, but (a) energetic zero and informational zero are different currencies, and (b) a generally applicable, uniquely defined *total* cosmological energy is not established in general relativity — global energy conservation is not well-defined without special conditions. Present the energetic cancellation as suggestive, no more.
3. **"Information" needs a specified measure.** The conjecture is rigorous only relative to a stated information measure (description length? von Neumann entropy relative to what basis? algorithmic complexity of what encoding?). Until then, "the total information content of reality is zero" is an explanatory conjecture, not a theorem — and, as you say, "an explanation-space, not an explanation."

Suggested phrasing: "the total information content of reality is zero — the only total that doesn't itself cry out for explanation. Conservation alone can't deliver this; it's a conjecture about which default is least arbitrary."

T2. Zero information $\rightarrow$ superposition principle $\rightarrow$ complex Hilbert space $\rightarrow$ strictly unitary QM

Status: conjecture. The reconstruction literature is a research direction, not a bridge.

What can honestly be said:

- **Purification is the closest formal echo.** In the Chiribella–D'Ariano–Perinotti reconstruction, quantum theory is singled out among causal probabilistic theories by one postulate: every mixed state is the marginal of a pure state of a larger system ([arXiv:1011.6451](https://arxiv.org/abs/1011.6451)); D'Ariano's group explicitly glosses purification as a strong principle of conservation of information ([arXiv:1411.2723](https://arxiv.org/abs/1411.2723)). This is the nearest thing in the literature to "the whole never has missing information." Use it by name — but note that CDP *postulate* purification alongside five other axioms; nothing derives the axioms from informational nothingness.
- **Falsifiability, stated precisely:** an observed breakdown of unitarity (objective collapse, GRW/CSL, Penrose) would refute not "the zero ontology" in the abstract but the *conjunction* of the zero ontology with the requirement of universal unitarity. That's still a substantive empirical commitment. And the record so far favours it: matter-wave interferometry now shows the superposition principle holding for sodium nanoparticles of 7,000+ atoms, 170 kDa, macroscopicity $\mu = 15.5$ — "no breakdown of the quantum superposition principle related to mass or size alone" (*Nature*); previous record [Fein et al. 2019, 25 kDa](#). Note what this does and

doesn't show: it tests the limits of superposition for massive objects; it does not test Everett, binding, or the zero ontology directly.

The gaps — three of which are internal to your own heuristic:

1. **Real amplitudes cancel too.** Summing two real numbers can yield zero as well; the vanishing of sums does not by itself select the complex field. Your sentence "amplitudes in QM are complex numbers... summing two amplitudes can yield zero" (from [your 2024 postings](#)) motivates cancellation in QM but underdetermines *complex* Hilbert space. The field structure needs an independent constraint (in the reconstruction literature, typically local tomography or similar). Flag it as a gap rather than an entailment.
2. **The zero vector is not a normalized quantum state.** Amplitudes for particular outcomes can cancel; the universal state vector itself does not cancel *into nothing*. The cancellation story is about descriptions *within* the formalism, not about the state being literally zero. Worth a sentence of care.
3. **"Complete mathematical symmetry" has a precise meaning that doesn't help here:** in finite dimensions, invariance under every unitary gives the maximally mixed density operator I/d , not an informationless pure universal state. What you actually want is the weaker, different claim — invariance under change of *description* basis (no canonically preferred basis), which you already argue elsewhere: "no canonically preferred bases of Hilbert space could exist without violating a zero ontology" ([your physicalism page](#)). Deploy *that* claim, not "complete symmetry."
4. **Wigner's theorem cannot be the bridge:** it presupposes the quantum state-space and transition-probability structure it would need to derive. Don't lean on it for the zero-to-quantum step.

Suggested phrasing: "Quantum-reconstruction theory offers a possible research direction — purification is its echo of the conjecture — but no connection from a zero ontology to the requisite axioms has been established. The claim is conjectural selection, not derivation."

T3. Unitarity → rare, life-supporting, quasi-classical Everett branches

Status: established physics (decoherence) plus open problems (measure, initial conditions).

Available bridges: decoherence theory and Zurek's quantum Darwinism explain observer-independent quasi-classicality and robust records. Your preferred-basis inversion is strong and underused: a canonically preferred basis would itself be information — so the absence of one is what a zero ontology predicts ([your physicalism page](#)). Make that move explicit here.

The gaps:

1. **The measure problem, stated fairly.** Squared-amplitude (Born) weights are mathematically available for specified decoherent alternatives; what's contentious is their probability interpretation and the choice of coarse-grained histories. The sharper criticism of your sentence is that "rare" and "tiny minority" suggest branch-*counting* intuitions, which the Everettian must replace with Born-weighted statements. Repair: "among the quasi-classical histories compatible with the state and dynamics, a minority are life-supporting" — and concede at the joint that you're not doing serious branch-weighting.

2. **Unitarity supplies neither initial conditions nor constants.** A fixed Hamiltonian gives every branch the same constants. The zero ontology, if it constrains anything, constrains the *form* of the laws (unitarity, no preferred basis); the values of the constants and the initial state are not delivered by it. "Everything follows from a zero ontology" is the single biggest overreach in the paragraph — scope it explicitly, or flag that delivering the constants would need a stronger "all possible Hamiltonians" multiverse argued separately.
3. **Wavefunction realism:** the universal wavefunction "lives" in configuration space; the ontological reading is controversial (your own caveat). Keep it as a flagged cost.

T4. Branches → life → self-replicators → nervous systems

Status: established mechanism, contingent outcome. The conditional form is already right.

Repair only: "in a tiny minority of branches" → "among quasi-classical histories" (T3.1).

T5. Nervous systems → phenomenal binding → world-simulations

Status: the most scientifically interesting link — a disputed premise with a proposed test, not an established result.

Available bridges:

- The Russell–Eddington–Feigl intrinsic-nature argument: physics is exhaustingly structural/dynamical; experience is the one candidate we know from the inside for the intrinsic nature the structure presupposes. Non-materialist physicalism drops the non-experiential "fire" assumption. State it as inference to the best explanation, not derivation.
- **Binding: your premise** — a unified world-simulation cannot be a classical object, because any classical fusion of distributed feature-processors loses the individuality of the features; quantum superposition of neuronal feature-processors can encode one. Present the classical impossibility as *your* contested claim (it is disputed), and note that quantum superposition doesn't by itself demonstrate phenomenal unity either — the superposition must be *experienced* as one, which is the conjecture.

The gaps:

1. **The standard objection:** Tegmark's decoherence timescales for the warm, wet brain — $\sim 10^{-13}$ – 10^{-20} s against $\sim 10^{-3}$ – 10^{-1} s neural dynamics ([arXiv:quant-ph/9907009](https://arxiv.org/abs/quant-ph/9907009)). Two honest notes: Tegmark's estimates concern specified physical models (ion superpositions, microtubules), not every possible quantum-consciousness proposal; and your own proposal apparently permits extremely brief coherent states, so the millisecond-coherence objection may miss it. But the objection can't simply be waved away — the burden of specifying what coherence, where, for how long, is on the proposal.
2. **The experiment needs specification before it can be called decisive.** "Interferometry on neuronal superpositions: functionless noise versus a perfect structural match" is the right *shape* of a test, but to count as a protocol it needs: the physical degrees of freedom and relevant coherence; an independently stated mapping from physical structure to phenomenal structure; an observable prediction that distinguishes the conjecture from ordinary quantum physics plus effectively classical neuroscience; and the sensitivity at

which a negative result counts against the conjecture rather than merely failing to confirm. Until then, present it as "the experiment that would decide it, if it can be specified."

3. **The acknowledged stopping point:** *why the cancellation takes the guise of experience at all* — no Rosetta Stone exists. Options: brute fact; the intrinsic-nature argument as inference to the best explanation; or honest deferral. Do not let the prose imply this is solved.

T6. Pain–pleasure axis → "reality's sovereign metric of (dis)value"

Status: substantive axiological premise — an axiom of the system, not an output of it.

The zero ontology is silent on axiology: that branches contain agents *believing* nihilism or perfectionism says nothing about which evaluative claims are true. What supports the claim: the self-intimating badness of agony. What does not: the exclusivity ("nothing else inherently matters") and the normativity. Keep the claim — it is the ethical engine of the system — but mark it as an axiom.

Two further gaps worth naming in the exposition:

1. **From valence to impartial concern.** The badness of *my* agony does not by itself supply the principles of impartiality, aggregation, and interpersonal comparison that a cosmic programme needs. That's a further ethical argument (which you have elsewhere), not a phenomenological given.
2. **From negative utilitarianism to bliss-maximization** (see T10).

T7. Darwinian ecosystems → Machiavellian apes → science, technology, AI

Status: natural history; contingent. "In one family of Everett branches" is exactly the right form. No repair.

T8. Transformer revolution → biohappiness revolution → designer babies → recursive biological superintelligence

Status: contingent scenario; some real research tools, no demonstrated enhancement.

Bridges: hedonic set-points are substantially heritable (twin studies, as you note on [your page](#)); CRISPR and polygenic screening exist as research tools; your signaling-dynamics argument for a reproductive ratchet once hedonic traits become choosable. Keep these as *bridges*, not evidence of outcome.

The gaps:

1. **Research tools ≠ demonstrated safe, effective enhancement.** Existing polygenic scores capture a fraction of variance; germline editing for hedonic traits is not an established practice. The honest claim is "the technical arguments are less convincing than they seemed three decades ago" (your own phrasing), not "the revolution is under way."
2. **Orthogonality:** a transformer-derived superintelligence does not automatically care about hedonic set-points. The chain needs an explicit alignment assumption.

3. Your own hedge belongs in the text: technical feasibility is not sociological plausibility; several centuries of Darwinian misery may remain.

T9. "Superintelligence ensures that the branch-weighted measure of suffering in the universal wavefunction is rigorously minimised"

Status: overreach — needs a narrower claim.

1. **Measure problem** (T3.1): "branch-weighted measure" implies a precision the theory doesn't yet deliver.
2. **Agency is limited, not absent.** Don't say superintelligence "cannot affect other branches at all": decoherence yields approximate dynamical autonomy, not an exact superselection rule, and an agent's present actions influence many subsequent branching histories. The correct narrowing: a superintelligence might reduce *expected* suffering across the future histories its actions can influence; it cannot guarantee a global minimum throughout the universal wavefunction.
3. **Benevolence $\neq$ feasibility.** Even granting alignment, "can ensure" overclaims: perfect knowledge, coordination, and optimality are further assumptions. Your own careful phrasing elsewhere is the right target: "try to make sure that unpleasant experience doesn't recur within our cosmological horizon" ([your Quora page](#)).

Suggested replacement: "If — a huge if — Earth-originating superintelligence is benevolent, it might reduce expected suffering across the future histories its actions can influence; no branch-local agent can guarantee a minimum throughout the universal wavefunction."

T10. The hedonium shockwave

Status: eschatological scenario; one genuine ethical gap, one avoidable tension.

1. **The genuine gap:** why does an overriding priority on *eliminating suffering* entail maximizing bliss beyond hedonic zero? It need not — that is a further premise (a secondary positive-value objective, or a different aggregative axiology). If you hold it, state it as such rather than letting "value-maximising" smuggle it in. (Conversely, don't attribute to yourself an intrinsic value of information-sensitivity: on exclusive hedonism, information-rich bliss can be instrumentally preferable without information being intrinsically valuable. Nor need hedonium be homogeneous or information-minimizing — that's an open engineering question, not a given.)
2. **The avoidable tension:** HI's core proposal is *gradients of intelligent bliss*; "pure bliss" hedonium maximizes subjective intensity at possible cost to function. You can keep both by presenting hedonium as one limiting case among value-maximizing end-states, or by arguing the convergence explicitly.
3. Cosmic limits already correct (Galaxy, Local Group, future light-cone). Keep.

Your autobiographical caveat deserves promotion from apology to feature: "this is the story told by one culture-bound primate in one family of branches; other stories could be told — and are."

3. Sentence-Level Repairs

1. "an informationless zero ontology... enforces complete mathematical symmetry" → "complete symmetry" has a precise meaning (invariance under all unitaries → I/d) that you don't want. Replace with the claim you actually defend: invariance under change of description basis — a canonically preferred basis would itself be information.
2. "This entails Dirac's superposition principle and, with it, complex Hilbert space" → "entails" is doubly unsupported (reconstructions postulate their axioms; real amplitudes cancel too, so cancellation doesn't select the complex field). Replace with conjectural selection plus the purification postulate named as the closest echo.
3. "rare, life-supporting branches" / "tiny minority" → "among the quasi-classical histories compatible with the state and dynamics, a minority..." — and concede at the joint that no serious branch-weighting is being done, and that unitarity supplies neither initial conditions nor constants.
4. "the axis discloses reality's sovereign metric of (dis)value" → keep, marked as an axiom of the system; add the impartial-concern step as a further ethical argument, not a phenomenological given.
5. "Superintelligence ensures that the branch-weighted measure of suffering... is rigorously minimised" → "might reduce expected suffering across the future histories its actions can influence; no branch-local agent can guarantee a minimum throughout the universal wavefunction."
6. "culminating in a cosmic... hedonium shockwave" → "culminating — perhaps —", with the eliminate-suffering vs. maximize-bliss step flagged as a further ethical premise, and hedonium presented as one limiting case.

4. The Revised Paragraph

(Compact version, matching the original's one-paragraph form. Bracketed items are suggested hyperlinks, since the original was hyperlinked. The technical audit above is separate; this is the exposition with qualifications at the joints.)

In principle — so I conjecture, not derive — everything follows from a zero ontology: my explanation-space for the riddle of existence. By "nothing" I don't mean a dark, timeless void, but zero information: the only total that doesn't itself demand explanation, though conservation alone can't deliver it (Tryon's zero-energy universe is a suggestive clue — energetic zero and informational zero are different currencies). A state of zero information can be nothing definite; it can only be a superposition of all possible descriptions, the quantum analogue of the Library of Babel. Conjecturally, no-collapse quantum mechanics — complex Hilbert space, strictly unitary dynamics — is the echo of this: quantum-reconstruction theory's purification postulate says the whole never has missing information. But no theorem derives the axioms from nothing, and the conjecture is falsifiable in one direction: any breakdown of unitarity, any "collapse of the wavefunction", would refute it. So far the superposition principle has been verified for sodium nanoparticles of more than 7,000 atoms. Unitary-only evolution yields quasi-classical Everett branches, among which are life-supporting histories — though I'm not doing any serious branch-weighting, and the zero ontology constrains the form of the laws, not the values of the constants. In a minority of effectively decohered branches arise multicellular, information-bearing self-replicators capable of rapid self-propelled motion. Such organisms evolve nervous systems that support phenomenally bound macroscopic world-simulations ("perception"): subjectively classical quantum minds that model the external environment — if, as I conjecture but cannot yet show, "Schrödinger's neurons" solve a binding problem that classically, I argue, has no solution. (The interferometric test — functionless noise versus a perfect structural match between phenomenology and physics — awaits specification.) These adaptive island-universes are equipped with an encephalised pain-pleasure axis, shaped by natural selection to track fitness-relevant patterns in the external world. Phenomenologically — and this is an axiom of my system, not a theorem of physics — the axis discloses reality's sovereign metric of (dis)value: nothing else inherently matters. In one family of Everett branches, repeated mass extinctions and hundreds of millions of years of selection pressure in suffering-ridden Darwinian ecosystems produce a hypersocial species of tool-making, language-using, sometimes violent Machiavellian apes that stumble upon science, technology, and AI. If the transformer revolution is followed by a biohappiness revolution, and a reproductive revolution centred on "designer babies" replaces Darwinian malware with recursively self-improving biological superintelligence, then mastery of our genetic source code would allow this transhuman primate to replace the pain-pleasure axis with a pleasure-superpleasure axis; to engineer a post-Darwinian transition to a nonviolent, blissful biosphere; and to build a transhumanist "Triple S" civilisation of superintelligence, superlongevity, and superhappiness. If — a huge if — Earth-originating superintelligence is benevolent, it might reduce expected suffering across the future histories its actions can influence; no branch-local agent can guarantee a minimum throughout the universal wavefunction. Billions of alien state-spaces of experience, infused with gradients of superhuman bliss, might then be systematically explored by neurochipped, AI-enhanced, genetically rewritten transhuman and posthuman superminds, culminating — perhaps — in a cosmic, value-maximising hedonium shockwave of pure bliss propagating through Earth's future light-cone. Whether eliminating suffering obliges us to maximize bliss beyond hedonic zero is a further ethical question — one I answer yes, as a further premise of my system.

(Optional coda, if the venue allows two paragraphs — your existing caveats, compressed and promoted to first-person voice:)

I can't pretend this is a derivation. The Hilbert-space realism of no-collapse QM is controversial; my non-materialist physicalism is an extreme version of the intrinsic-nature argument; my account of phenomenal binding is experimentally untested; and I simply do not understand why the cancellation takes the guise of experience — the "fire" in the equations of QFT remains, for me, the deepest mystery. My futurology is speculative; my eschatology is obliquely autobiographical — the tidy narrative of one culture-bound primate in a tiny fraction of effectively decohered branches. Some very different stories could be told — and are.

5. Sources

- David Pearce, [Quora Answers 2015–2026](#) — the zero ontology, Schwindt's "Nothing happens in the Everett universe," Quine's *Universal Library*, the cosmological-horizon phrasing, twin-study hedonic-set-point claims.
- David Pearce, [Why Does Anything Exist?](#) — zero-information conjecture, conserved constants, the Rosetta Stone.
- David Pearce, [Non-materialist physicalism](#) — no preferred bases without violating a zero ontology; Schrödinger's neurons.
- David Pearce, [2024 postings](#) — "an informationless Zero Ontology only works because amplitudes in QM are complex numbers, and summing two amplitudes can yield zero."
- Chiribella, D'Ariano & Perinotti, [Informational derivation of Quantum Theory](#), Phys. Rev. A 84, 012311 (2011) — the purification postulate (with five further axioms, postulated not derived).
- D'Ariano et al., [Conservation of information and the foundations of quantum mechanics](#) — purification glossed as a strong conservation-of-information principle.
- Tegmark, [The importance of quantum decoherence in brain processes](#), Phys. Rev. E 61, 4194 (2000) — model-specific decoherence timescales 10^{-13} – 10^{-20} s.
- [Probing quantum mechanics with nanoparticle matter-wave interferometry](#) and [arXiv:2507.21211](#) — sodium nanoparticles, 7,000+ atoms, 170 kDa, $\mu = 15.5$; tests limits of superposition, not Everett, binding, or the zero ontology.
- Fein et al., [Quantum superposition of molecules beyond 25 kDa](#), Nature Physics 15, 1242 (2019) — previous interferometry record.