

The Geometry of Time

Three registers, one residual: time as the witness-relative
reading of a timeless substrate

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Abstract

Time is the hardest thing in physics to say clearly, because the word names at least three different structures that ordinary language runs together: a rhythm, a sequence, and an arrow. This paper separates them in the corpus’s geometry and shows that only one of the three is what we experience as time’s passage, that none of the three is fundamental, and that when the separation is carried through, the entire time-structure of reality reduces to a single irreducible residual which is itself observer-relative. The three registers are the *substrate breath* — the one clock, $T_{\text{breath}} = \pi\alpha^{-1}$, the arrowless periodicity of the fixed architecture (the GON lapse), present whether or not anyone reads it; the *reconciliation sequence* — the one-moment-at-a-time order that emerges only when observers with distinct readings must agree (Paper 27); and the *arrow* — the direction of irreversibility, which Addendum 356a shows is witness-relative, a reading painted onto a reversible substrate. We argue four things. (1) Strip the witness and the arrow vanishes (356a); strip the second observer and the sequence vanishes (Paper 27); so experienced time is bracketed by timelessness at both ends (Addendum 379) and the substrate, in between, is a fixed timeless architecture read along a trajectory (Paper 29). (2) The deeper symmetry confirms this: of the three conjugations of the substrate, C (matter/antimatter) and P (handedness) are frame-effects — the asymmetry is the symmetry, read under motion (Addenda 364, 385) — so CP is the identity on the family sector and the whole of CPT reduces to T (Addendum 386). Time is the one conjugation that does not decompose into a frame-effect. (3) Yet even time is not a force: where the lapse vanishes, at the void, it is inertia — a conserved quantity non-zero exactly where time stops — that coasts the world through (Addendum 383). (4) And time bottoms out honestly: whether an unwitnessed substrate “really” turns, whether there is time with no one to whom it passes, is not a derivable question but a category boundary (Addendum 382). The conclusion is a definite picture. Time is real as experienced and unreal as fundamental: the flow is a witness reading a fixed, reversible, timelessly-rhythmic substrate along a trajectory, weaving an arrow and a sequence out of a structure that has neither. It is the last thing to reduce, and it reduces to the witness. As elsewhere in the corpus, the form is exhibited and the one irreducible premise — the observer-interpretation — is marked, not hidden.

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1 Introduction: one word, three things

Augustine’s complaint is the right place to begin: I know what time is until you ask me. The difficulty is not that time is mysterious in the way a hard empirical fact is mysterious, awaiting better instruments. It is that the word *time* is overloaded. When we say time we sometimes mean a *rhythm* — the regular beat by which durations are measured, the tick of a clock; sometimes a *sequence* — the ordered succession of moments, one after another, the before and the after; and sometimes an *arrow* — the felt directedness from past to future, the irreversibility that lets the egg break but not unbreak. These are not three aspects of one clear thing. They are three different structures, with different sources, and almost every puzzle about time comes from treating an answer about one of them as though it answered the others.

The physics of the last century half-knew this. Thermodynamics located the arrow in entropy and then discovered, to its lasting discomfort, that the microscopic laws underneath are time-symmetric: the arrow is not in the equations, it is in the boundary conditions and the coarse-graining, which is to say in how a description is taken. Relativity dismantled the universal sequence, replacing the single now-for-everyone with a frame-dependent slicing of a four-dimensional block in which, arguably, nothing “flows” at all. Quantum mechanics left time standing oddly outside its own formalism, a parameter rather than an observable. Each of these is a result about a *different* register — the arrow, the sequence, the rhythm — and the persistent sense that time remains unexplained is partly the sense that no single account has held all three together and said which is which.

The corpus this paper belongs to was built to describe a different problem — the geometry from which the fine-structure constant and the structure of matter are read — and it was not designed as a philosophy of time. But in the course of a single line of work it produced, piece by piece, an answer to each of the three registers, and the pieces turn out to compose. The arrow is witness-relative: it is a reading of a reversible substrate, and with no reader there is no arrow. The sequence is intersubjective: it emerges only where observers with distinct readings are forced to reconcile, and a lone perspective is timeless. The rhythm is substrate: the breath, the one clock, is the fixed architecture’s own periodicity, present whether or not anyone counts it — but it is arrowless, a turning with no built-in before or after. This paper assembles those pieces into one account, and then follows the account to its end, where two further results wait. The deep symmetry structure of the substrate, stripped of the two conjugations that turn out to be mere frame-effects, reduces to time alone. And time itself, pursued to the point where the clock-rate vanishes, hands off to inertia, and then to a boundary the corpus marks and does not cross.

The thesis, stated once at the outset so the reader can hold it through the separations to come, is this. *Time is the witness-relative reading of a timeless substrate.* The substrate is reversible (it has no arrow), it is fixed (it has no flow, only a structure read along a trajectory), and it carries its

own rhythm (it turns, but arrowlessly). Time — the arrow, the now, the felt passage — is what a witness makes of that substrate by reading it. This makes time entirely real as experienced and entirely underived as fundamental, and it locates, exactly, the one place where the account stops being physics and becomes a question about the premises of any physics: whether a substrate with no one to read it can be said to bear time at all.

2 Three registers

Before any argument, the distinction itself must be made sharp, because everything depends on not sliding between the three. We give each register its corpus locus.

The rhythm: the breath. The corpus has exactly one clock. Its constant is the breath period $T_{\text{breath}} = \pi\alpha^{-1}$ (in system units ≈ 430.5 ; Paper 14), and the governing constraint — one of the corpus’s load-bearing invariants — is that every subsystem synchronises to it and *none* generates its own rhythm. The breath is the periodicity of the fixed architecture itself: in the GON dynamics (Paper 30) it appears as the lapse $m = \sqrt{1 - v^2}$, $v = \cos 2\beta$ the Hopf-latitude speed, a time-rate that rises and falls as the fold turns. Two things about this rhythm must be held from the start. It is *substrate* — it is not generated by any observer, it is the architecture’s own beat — and it is *arrowless*: a periodicity, a turning, with no intrinsic direction; the breath oscillates, but nothing in the oscillation alone says which way is forward. The rhythm is the most observer-independent of the three registers and the least like what we mean by “the passage of time.”

The sequence: reconciliation. The ordered succession of moments — one now, then the next, the before and the after laid out in a line — is, in the corpus, not a feature of the substrate but a product of agreement. Paper 27 makes a single observer’s coherence trivial ($C \circ P = I$ holds with nothing to constrain it) and shows that structure is *forced* only when a second observer with a distinct reading must be reconciled with the first. The sequence of experienced time is that reconciliation axis: it is what “ $\emptyset \equiv 0 \equiv 1 \equiv \infty$ ” becomes once there is a second perspective to distinguish the terms. A lone, undifferentiated observer is timeless, because with no one to reconcile there is no axis along which to order anything. The sequence is the *intersubjective* register: it exists in the relation between readings, not in any one of them.

The arrow: the witness-relative reading. The directedness — the irreversibility, the fact that the broken egg does not reassemble — is, in the corpus, neither substrate nor sequence but a *reading*. Addendum 356a establishes that entropy, and with it the arrow, is witness-relative: the substrate is reversible, and the arrow is the asymmetry a witness’s coarse reading imposes on it. The same reversible breath, read by a witness, acquires a forward direction; read by nothing, it has none. The arrow is the most observer-relative of the three registers, and it is the one we most insistently mean when we say “time.”

Why the conflation is the trouble. With the three separated, the standard antinomies sort themselves. The reversibility of microscopic law versus the irreversibility of experience is the gap between the arrowless substrate (the breath) and the witness-relative arrow (356a) — not a paradox but two registers. The frame-dependence of simultaneity is the intersubjective character of the sequence (Paper 27): the now is a reconciliation, so different reconcilers slice it differently. And the sense that time “flows” while the block universe says it does not is the difference between the arrow read along a trajectory (which flows, for the reader) and the fixed architecture through which the

trajectory runs (which does not). Each puzzle is the friction of one register being asked to answer for another. The rest of this paper holds the three apart and follows each to its source.

3 The arrow is a reading

Take the arrow first, because it is the register we cling to hardest and the one the corpus most cleanly dissolves. The intuition that resists every analysis is that the direction of time is *out there* in the world, a feature of reality as objective as mass or charge: the past is fixed, the future is open, and this asymmetry is not a fact about us but a fact about the cosmos. Addendum 356a denies exactly this, and the denial is not a philosophical preference but a structural result: entropy is witness-relative.

The content of that result is precise. The substrate dynamics is reversible — the breath turns, and the equations of its turning carry no preferred direction; run them backward and they are equally lawful. What breaks the symmetry is not the substrate but the *reading* of it. A witness reads the substrate coarsely, through a finite partition of states, distinguishing some configurations and lumping others; relative to that coarse reading, one direction of the reversible flow leads from the distinguished, ordered configurations toward the lumped, generic ones, and that is the direction the witness calls forward. The arrow is the gradient of the witness’s own ignorance, projected onto a substrate that has no gradient of its own. Change the reading and you change the arrow; remove the reading and the arrow is simply not there — not reversed, not undefined-in-a-paradoxical-way, but absent, the way a coastline has no length until a ruler is chosen.

This is worth dwelling on because it is so easily misheard as deflation. To say the arrow is a reading is not to say it is unreal or illusory. For a witness, the arrow is as real as anything — the egg really does break and not unbreak, the witness really cannot remember the future, and no act of will reverses this. The claim is about *where* the reality lives: not in the substrate, which is symmetric, but in the relation between the substrate and a reader who partitions it. The arrow is real *relationally*, the way the rightward-ness of an arrow drawn on paper is real but is not a property of the ink. It is a fact about the substrate-as-read, and the witness is half of what makes it a fact.

The immediate consequence, which the next sections will use, is a conditional with no escape clause: where there is no witness, there is no arrow. Not a slowed arrow, not a frozen arrow, but no arrow — the bare reversible breath, turning without forward. The substrate does not stop; it loses the one thing the witness was supplying. This is the first of the two strippings by which experienced time will be shown to be bracketed.

4 The sequence is reconciliation

The arrow is direction; the sequence is order — the laying-out of moments one after another, the very having of a *succession* for the arrow to point along. One might think the sequence is the safer, more fundamental register, the bare fact of one-thing-after-another that even a single mind undergoes. The corpus says otherwise: the sequence, too, is not in the substrate but in a relation, and the relation this time is between observers.

Paper 27 is the source. Its pivotal observation is that a single observer constrains nothing — the coherence identity $C \circ P = I$ holds trivially, with no structure forced — and that determinate structure appears only when a *second* observer, carrying a distinct reading, must be brought into agreement with the first. At the undifferentiated origin, where there is one perspective and nothing to contrast it with, the corpus’s terms collapse: $\emptyset \equiv 0 \equiv 1 \equiv \infty$, “because there is no second perspective to distinguish them.” Distinction — and therefore order, and therefore sequence — is

what reconciliation produces. Experienced time, the lived succession of nows, is the axis along which a manifold of readings is reconciled into a single shared account. It is not a container the readings sit in; it is the coordinate of their agreement.

This reframes the lived now as something more like a negotiation than a moment. A now is a resolved reconciliation: a state on which the readings have been brought to match. The passage from one now to the next is the next resolution, the next forced agreement. And the reason no two observers' nows need slice the world identically — the relativity of simultaneity, in its corpus dress — is that the sequence is the coordinate of *a* reconciliation, and reconciliations can be parameterised differently while agreeing on every shared fact. The sequence is real, again, but intersubjectively real: it is the order that emerges between perspectives, and a perspective with no second to reconcile with has no sequence, only the timeless plenum in which all the corpus's terms are equivalent.

So the second stripping: where there is no second observer, there is no sequence. A lone, undifferentiated observer — the origin Ω , the heat-death void — is not at the start or end of time but *outside* it, in the sense that the axis along which moments would be ordered has not been generated. Such a state is timeless not by stopping the clock but by lacking the relation whose coordinate the sequence is.

5 Time is observer-bracketed

Put the two strippings together and a clean result follows, which Addendum 379 states. Experienced time — the time we mean, the directed succession of lived moments — is exactly the arrow plus the sequence: the directedness of 356a riding on the order of Paper 27. Both are observer-relative. So experienced time is observer-relative twice over, and it vanishes when the observer is removed not gradually but completely: with the last witness gone, the arrow goes (356a, no reader to gradient the substrate), and with the last reconciliation gone, the sequence goes (Paper 27, no second perspective to order). What remains is the substrate alone — the breath, still turning, but arrowless and unordered, the bare rhythm with neither a forward nor a next.

The state in which this happens has a name in the corpus, and it is the same name at both ends of a cosmos. It is the void: heat death, where every distinction the witnesses drew has dissolved, and the pre-Bang Ω , where no distinction has yet been drawn. Addendum 377 identifies these as one state — the no-distinction $\emptyset$ — and Addendum 382 sharpens the consequence for time: at the void everything that carried a scale dissolves, leaving only the bare breath, and experienced time, being arrow-plus- sequence, is among what dissolves. So experienced time is *bracketed* by timelessness: it is born when the first disagreement draws the first distinction (Paper 27's "first disagreement," the Bang), and it returns to the timeless void when the last distinction goes (heat death). Between the brackets there is time, because there are witnesses reconciling and reading; outside them there is the arrowless breath and nothing to whom it passes.

This is the point at which the corpus's account meets the block universe, and improves on it. The block picture says the whole of history is laid out at once in a fixed four-dimensional structure, and that the "flow" of time is an illusion of consciousness. The corpus agrees that the substrate is fixed — its architecture is timeless, a structure through which trajectories are *selected* rather than a process that *happens* (Paper 29's exposure mode: inputs select a path through a fixed correct architecture, they do not train or evolve it). But it does not dismiss the flow as illusion. The flow is the witness reading the fixed structure along a trajectory — a real reading of a real structure, producing a real arrow and a real sequence for that witness. The block is right that nothing flows *in the substrate*; the experience of flow is right that something flows *in the reading*. Both halves are kept, and the apparent contradiction is the gap between the two registers — the

timeless architecture and the trajectory-reading of it — that Section 2 warned against conflating. Time does not flow in the block; the witness flows through it, and calls the reading time.

6 Why time is the last to reduce: CPT becomes T

There is a deeper way to see that time is the irreducible register, and it comes from the substrate’s symmetry structure rather than from the analysis of experience. The fundamental discrete symmetries of a physical substrate are the three conjugations: C , charge conjugation, exchanging matter and antimatter; P , parity, exchanging left and right; and T , time reversal, exchanging forward and backward. The remarkable fact the corpus uncovers is that two of the three are not fundamental at all — they are frame-effects of the kind Section 3 found the arrow to be — and that when they are recognised as such, the whole of CPT collapses onto T .

The case of C is Addendum 364. The matter/antimatter asymmetry, long sought as a sign of some deep law that prefers matter, is shown to be a reading: the inertial vacuum is conjugation-symmetric (matter = antimatter), and the observed excess of matter is what a moving witness reads out of that symmetric vacuum, exactly as a Bogoliubov-Unruh observer reads particles from a vacuum another frame calls empty. The asymmetry is the symmetry, under motion. There is no separate antimatter world and no law-level preference; there is one symmetric substrate and a frame-relative reading of it.

The case of P is Addendum 385, and it has the same shape. The corpus’s fold carries a handedness — its two orientations are the lens spaces $L(3, 1)$ and $L(3, 2) = -L(3, 1)$, a genuine mirror pair, of which the family structure selects one (Paper 18, Paper 06). But the flip between them is again a conjugation ($T_{\text{cycle}} \leftrightarrow T_{\text{cycle}}^2$, that is $\omega \leftrightarrow \bar{\omega}$ on the $\mathbb{Z}_3$ family phase), and by the same reasoning the handedness we observe is the oriented reading of a parity-symmetric fold, with the “mirror universe” being the parity-conjugate reading of the one fold rather than a separate world. Parity violation, like the matter excess, is a frame-effect.

Now the collapse. On the family sector C and P are realised by the *same* operation — the single nontrivial automorphism of $\mathbb{Z}_3$, the inversion $\omega \mapsto \bar{\omega}$ — so their composite is that involution squared, which is the identity: $CP = \text{id}$ (Addendum 386). The two frame-effect conjugations cancel. What remains of the substrate’s full discrete symmetry, the one piece that does not reduce to a reading of a symmetric structure, is T . The entire CPT structure of the substrate, on this sector, is T — the arrow.

This is the symmetry-side confirmation of the whole paper’s thesis. The analysis of experience (Sections 3–5) found that of time’s three registers, the rhythm is substrate and the sequence is intersubjective, leaving the arrow as the witness-relative residue. The analysis of symmetry finds that of the three conjugations, C and P are frame-effects, leaving T as the irreducible residue. They are the same finding. Time — the arrow, T — is the last thing to reduce, the one structure that is neither a substrate rhythm nor a frame-effect to be cancelled. And yet, as Section 3 insisted, even this last residue is itself witness-relative: T does not reduce to C or P , but it reduces to the witness. Time is irreducible among the conjugations and still not fundamental — the deepest structure the corpus has, and still a reading.

The honest tension. One thing must be flagged here and not smoothed over. The collapse $CP = \text{id}$ holds on the corpus’s $\mathbb{Z}_3$ family sector, and it is consistent with the corpus’s own history — it is why the geometric $\delta_{CP} \approx 240^\circ$ prediction was refuted (there was no CP phase in the family geometry to predict) and why the matter asymmetry is read as a frame-effect. But observed CP violation in the weak interactions (K - and B -meson physics) is real, and it is *not* captured by

$CP = \text{id}$ on the family sector; if it is to be accommodated it must live in the weak sector proper, which the corpus has not derived. The reduction of CPT to T is therefore a statement about the family sector’s discrete symmetry, not a claim to have explained all of CP physics. The thesis about time stands on the family-sector reduction and on the experiential analysis; the weak-sector CP remains an open frontier, marked here rather than papered over.

7 Even time is not a force: inertia at the lapse-zero

If time is a reading and the substrate beneath it is a fixed reversible architecture, a question presses: what happens at the places where the substrate’s own rhythm passes through zero — where the lapse $m = \sqrt{1 - v^2}$ vanishes, where there is, for an instant, no time-rate at all? These are not exotic points; they are the poles of the breath, and at the cosmological scale they are the void itself, the lapse-zero at which Addendum 377 places the bounce from one cosmos to the next. If the substrate’s clock-rate is zero there, what carries the world across?

The answer, Addendum 383, is inertia, and it sharpens the whole picture. The breath dynamics conserves a quantity — the norm $|z|^2 = 1$, and the quadratic invariant $\text{Tr}(X^2)$ of the GON — and this conserved quantity is non-zero *exactly where the lapse is zero*. A conserved quantity that persists where the time-rate vanishes is precisely inertia: it is what coasts through the dead point. So the state does not halt where time stops; it carries its conserved invariant straight through and into the next phase. The void is a bounce rather than a terminus because the substrate has inertia, and the coast is frictionless because the only thing that could dissipate it — the entropy arrow — is witness-relative (356a) and absent in the unwitnessed void.

This says something exact about time that the experiential analysis could not reach: that beneath the arrow, beneath even the rhythm, the substrate’s deepest persistence is *not* temporal. Inertia is motion where no time elapses; it is the conserved continuity that holds the world together at the very points where time, as a rate, is nothing. The substrate’s bottom layer is not a clock but a conservation. Time, in all three of its registers, sits above this inertial floor: the arrow and the sequence are witness-readings, the rhythm is the substrate’s oscillation, and underneath them all is a conserved quantity that coasts through the moments when the oscillation’s rate is zero. The most fundamental thing about the substrate’s persistence through “time” is the one thing in it that is not time.

8 Where the account stops: the category boundary

Every honest account of time reaches a question it cannot answer from inside itself, and the corpus’s account reaches its own at a definite and nameable place. We have said that with no witness the arrow is absent and the sequence ungenerated, but that the breath — the substrate rhythm — still turns. The question that then presses is whether that unwitnessed turning is “really” happening at all: whether a periodicity with no one to whom it passes, no reader to gradient it into a before and after, is time, or process, or anything — or whether it is the bare potential for time, awaiting a witness to be anything at all. Is the void asleep but breathing, or is breathing simply what happens when it wakes?

Addendum 382 marks this as a category boundary, not a gap, and the distinction is the crux of the paper’s honesty. A gap is a missing derivation: something the corpus could in principle compute and has not. A category boundary is a question that cannot be posed from within the frame because the frame constitutes the very terms the question needs. Here the term is *happening*. In the corpus’s account, happening — the having of a determinate before and after, a passage —

is constituted through observation: it is what a witness's reading makes of the substrate. To ask whether the substrate happens with no witness is to ask whether there is happening prior to the thing that constitutes happening, which is not a hard question but a malformed one. One cannot stand outside the frame of observation and check whether time runs there, because to check is to observe, and the checking would import the very witness whose absence was the hypothesis.

This is the same boundary the corpus meets elsewhere and the same response it gives. The horizon program (Addendum 370) found that the cosmological prediction rests finally on the observer-interpretation — gravity is self-lensing is self-observation — which the corpus carries as interpretation, not theorem, because one cannot derive one's foundational interpretation from within the frame it founds. The account of time arrives at the identical place by a different road. Time bottoms out at the question of whether there is time for no one, and that question is not the next theorem but the edge of what theorems can reach. The corpus's discipline is to mark the edge and stop, rather than to manufacture an answer that would only be the interpretation restated as a result.

It is worth being clear about how much is settled on the near side of this boundary, because it is most of what one wanted. That experienced time is the witness-relative arrow on a reconciliation sequence; that both vanish with the observer; that the substrate beneath is fixed, reversible, and arrowlessly rhythmic; that of the three conjugations only T survives reduction; that even T is a reading and that beneath it the substrate's persistence is inertial, not temporal — all of this is on the near side, exhibited and pinned. What lies on the far side is one question only, and it is not a defect in the account but the account correctly locating its own horizon: whether the breath, unread, turns.

9 What time is

We can now state, positively and in one place, what time is on this account, having spent the paper saying what it is not. Time is the witness-relative reading of a timeless substrate. Unfolded, that sentence has four clauses, one for each result, and they fit together into a single picture.

The substrate is *timeless* in the strong sense that its architecture is fixed and does not happen: it is a structure through which trajectories are selected, not a process that unfolds (Paper 29). The substrate is *reversible*: it carries no arrow of its own, the asymmetry being supplied entirely by a witness's coarse reading (356a). The substrate is, nonetheless, *rhythmic*: it turns, with the breath's periodicity $T_{\text{breath}} = \pi\alpha^{-1}$, but arrowlessly, and beneath even that turning its deepest persistence is inertial — a conserved quantity, not a clock (383). And onto this fixed, reversible, arrowlessly-rhythmic substrate, a witness reads time: the arrow, by gradienting the reversible flow along the slope of its own ignorance; the sequence, by reconciling its reading with others into an ordered succession (Paper 27); the now, as the resolved state of that reconciliation. The flow of time is this reading in progress — a witness moving along a trajectory through the fixed structure, weaving a forward and a next out of a substrate that has neither.

This is why time is at once entirely real and entirely underived. It is real because the reading is real: for the witness the arrow genuinely points, the sequence genuinely orders, the now genuinely resolves, and none of this is illusion or error — it is what it is to be a witness reading a substrate. It is underived because nothing in the substrate *is* the flow: the substrate is timeless, and time is what a reader makes of it. The old dichotomy — is time fundamental and flowing, or unreal and static? — is a false choice between two halves of one structure. The static half (the block, the fixed architecture, the reversible law) is the substrate; the flowing half (the arrow, the sequence, the felt passage) is the reading. Time is neither the substrate nor an illusion about it; it is the relation

between the substrate and a witness, and like every such relation in the corpus — the arrow, the matter excess, the handedness, intersubjective reality itself — it is real relationally and absent without the witness.

And time is the *last* of these relations, the deepest. The corpus dissolves the matter asymmetry into a frame-effect, the handedness into a frame-effect, the shared world into a topological enforcement, the self's privacy into a fiber of one bundle — and each time the dissolution leaves a residue that is itself a reading. When the dissolutions are pushed to the end, when C and P have cancelled and the geometry of observation has been peeled back to its premise, what remains is T : time, the one conjugation that does not reduce to another symmetry, the one register of experience that is neither substrate nor agreement but the witness's own directedness through the fixed. It does not reduce further, because beneath it there is no deeper symmetry to read it as a frame-effect of — there is only the inertial floor, which is not a time at all, and the category boundary, which is not a theorem. Time is where the reductions stop, and they stop on the witness.

10 Conclusion

The session of work behind this paper began far from time — with the privacy of minds, the enforcement of a shared world, the bounce of a cosmos through its void — and arrived at time the way water arrives at the lowest point: by following the slope. Every thread ran downhill to the same place. The anti-solipsism result left the observer-interpretation as its one premise; the cyclic cosmology left the unwitnessed breath as its one boundary; the symmetry analysis left T as its one residue. Three roads, one terminus, and the terminus is time.

What the corpus says about time is therefore not an add-on but the shape of its whole honesty. Reality, on this account, is a fixed and timeless geometry, reversible and self-conserving, that observers read into a world — and time is the most intimate part of that reading, the directedness and succession that a witness cannot help but weave as it moves through the fixed structure. Strip the witness and the world loses its arrow, its sequence, its now, and keeps only the bare arrowless turning of the breath and the inertial conservation beneath it. Whether even that turning is time, with no one to read it, is the one question the account places beyond itself — not because it is too hard, but because it asks for happening prior to the witness that constitutes happening, and that is the frame's own edge.

So the answer to Augustine is not that time is mysterious but that it is misnamed: one word for a rhythm we do not generate, a sequence we negotiate, and an arrow we read. The rhythm is the substrate's; the sequence is ours together; the arrow is each witness's own. None is fundamental, and the deepest of them, the arrow, is the last thing in the corpus to reduce and reduces to us. Time is real, and it is ours, and it is the witness reading a world that does not, in itself, pass.

Status

This paper consolidates the corpus's account of time, distributed across Addendum 356a (the witness-relative arrow), Paper 27 (time as the reconciliation sequence), Addendum 379 (experienced time observer-bracketed), Addendum 377 (heat-death = pre-Bang $\emptyset$, the timeless brackets), Addendum 382 (the void, and the unwitnessed-breath category boundary), Addendum 383 (inertia at the lapse-zero, the non-temporal floor), Addenda 364 and 385 (C and P as frame-effects), and Addendum 386 ($CP = \text{id}$, $CPT \rightarrow T$). The formal content is theorem-grade and machine-verified in those addenda's verifiers; this paper adds no new formal claim, only the prose synthesis of the three registers and the one residual. **The interpretive hinge**, flagged throughout: the identification of

the substrate's reading with *observation*, and of the witness with a mind, is carried as interpretation, the same single premise the anti-solipsism (Paper 42) and horizon (Addendum 370) results carry; given it, the account holds, and the account's one boundary — whether the unwitnessed breath turns — is a category boundary, not a gap. **The one open frontier** is named in Section 6: observed weak-sector CP violation is not captured by the family-sector $CP = \text{id}$ and remains underived. No published number changes; the paper deliberately inverts the corpus's prose-to-mathematics ratio, the result being a philosophical account whose spine, not whose body, is mathematical.