V.F.S. 4.7

The Reader

Observability, Gate-Memory Certification, and the Boundary of Reading

This volume constructs a *reader formalism*, not an actor and not an occupant of a position. Reader axioms and admissibility rules are [proposed]. Statements marked [derived from frozen 3.6] are identities or typing facts about the Vessel. Statements marked [derived / relative] are logical consequences of the proposed reader definitions together with those frozen facts. No theorem in this volume asserts that a reader entity exists.

Abstract

V.F.S. 4.7 develops a passive reader theory over the frozen 3.6 interface. It separates direct-state readout from interface-certified observation, derives a hybrid observation clock, and identifies a finite extra-interface scalar block that distinguishes states hidden by the reduced projection.

For gate memory, selection-independent certification is reduced to the overlap quotient of the set-valued canonical junction relation. The adopted realizability and reflexivity axioms make such certification equivalent to conservation on realized positive events without selecting the quotient.

The inherited smooth dwell dynamics is then analysed exactly. Forward and backward transmission possess different first integrals, and for the frozen parameter set bidirectional local accessibility forces every universal gate-memory dwell invariant to be constant.

The remaining possibility of a nonconstant gate-memory Resurrectio certificate is therefore located at the junction itself. Frozen 3.6 does not select the required junction relation. That question is consequently exported as new constitutive structure rather than answered by a stronger reader axiom.

Contents

What this volume is, and what it is not

V.F.S. 3.6 closes the interface theory of the Vessel: it fixes how the Lorentzian interior, the reduced Riemannian state, the folding sector, the reception ledger and the canonical junction are related, and — decisively for what follows — it makes explicit *which information the reduced projections destroy*.

The next question is therefore not another question about internal dynamics. It is a question of reading:

What can be known about the Vessel without acting on it?

This volume does not begin by answering that question. It first does something logically prior and much cheaper: it determines *what is available to be read at all*. The whole of this opening is an audit, in the idiom of 3.6's own § "Audit of the dependence of the 3.6 results on Σ": a ledger over every coordinate of the union state, recording for each one whether the reduced projection already sees it, whether it survives the $\mathbb{Z}_2$ gauge, and whether it is typed through the canonical junction. The reader's admissible observable space is then *read off* that ledger rather than postulated.

Scope

"External" here means external to the informational boundary of the 3.6 interface. It does **not** mean ontologically outside the Vessel, outside the physical theory, or outside creation. No claim is made that a reader exists, is occupied, or acts. [proposed]

Inherited open items

F1–T — inherited.
General hybrid existence, continuation and reset compatibility are not established globally. No use is made of a global theorem of this kind.

$\mathcal{J}_{KW}$ **— exported by 3.6.**
The canonical gate-memory selection law is unresolved. §6 does not supply such a law; it identifies precisely where its absence limits cross-junction observability.

The distributed-facet architecture and its circuit holonomy are not imported; their former F0 and K0 assumptions are therefore not dependencies here. A holonomy construction, if ever reintroduced, must be re-derived inside the one-Vessel architecture rather than inherited.

1 Reader, not actuator

Axiom 1.1 (Non-actuating reader)**.** The reader modifies no state equation, reset law, folding dynamics or junction law of V.F.S. 3.6:

$$\boxed{\text{reading} \neq \text{acting.}}$$

If X denotes the physical state, the existence of a reader adds no reader-dependent term to $\dot{X} = F(X, \cdot)$ and does not alter any junction map $X^- \mapsto X^+$. [adopted in 4.7]

Remark 1.2 (relation to the earlier relational discipline)**.** The present construction assumes a completely passive reader: observation changes no coordinate of the Vessel. Any comparison with the separate relational discipline of V.F.S. 4.6 is background only and is not used as a premise anywhere below. Thus no result depends on a claim that the present rule is formally "stronger" than a particular 4.6 gate law. [scope / no dependency]

▹ *Plain.* We are asking what can be seen, not what can be done. A theory in which looking changes the thing looked at is a different theory, and would have to say so out loud.

2 The reader triple

Definition 2.1 (Reader)**.** A reader is a triple

$$\boxed{\mathcal{O} = \big(Y_{\text{obs}},\ \mathcal{R},\ \tau_{\text{obs}}\big),}$$

where Y_{obs} is the observable space, $\mathcal{R} : X_{\text{core}}^{\text{union}} \to Y_{\text{obs}}$ the reader map, and τ_{obs} the parameter with respect to which observations are ordered. The domain of $\mathcal{R}$ is the 3.6 union state

$$X_{\text{core}}^{\text{union}} = \big(V, F, \sigma_L, \lambda, \lambda_{\text{form}}, \Omega_P, H_K, W, G_{\text{recepta}}, H_R;\ q_{\text{fold}}(\cdot)\big).$$

$\mathcal{R}$ is not assumed injective: $X_A \neq X_B$ does not imply $\mathcal{R}(X_A) \neq \mathcal{R}(X_B)$. [proposed]

Remark 2.2 (why the domain must be $X_{\text{core}}^{\text{union}}$ and the target must not be)**.** Taking $X_{\text{core}}^{\text{union}}$ as the domain is what makes the reader question non-vacuous: the reader may in principle see anything the theory carries. It is Y_{obs} — the *target* — that must be earned, coordinate by coordinate. Fixing Y_{obs} by fiat at this stage would smuggle in the answer; the ledger of §6 derives it instead.

3 Direct readout and interface certification

Definition 3.1 (Gauge-admissible direct readout)**.** A functional $\mathcal{A} : X_{\text{core}}^{\text{union}} \to Z$ is a *gauge-admissible direct readout* if $\mathcal{A}(\mathfrak{g}X) = \mathcal{A}(X)$ for the frozen global folding gauge $\mathfrak{g} : q_{\text{fold}} \mapsto -q_{\text{fold}}$. This is an instantaneous condition on a realized union state. It requires no junction law for the coordinate being read. [proposed]

Definition 3.2 (Interface-certified observable)**.** A gauge-admissible direct readout is *interface-certified across* $\mathfrak{R}_{3.0}$ if frozen 3.6 determines its post-junction value from the declared prestate and event data without an additional output-selection postulate. Exact reset formulae, continuity laws and exact invariants qualify. A coordinate whose post-junction value is only known to belong to an unresolved set-valued relation is not interface-certified as a realized scalar value. [proposed]

Remark 3.3 (Reading is not predicting)**.** Failure of interface certification does *not* mean that a realized post-junction value is intrinsically unobservable. For example, H_K and W are coordinates of the realized union/junction state; a stronger direct-state reader could simply include their realized values in its target. What frozen 3.6 does not provide is a unique law transporting those realized values from prestate and event data through $\mathfrak{R}_{3.0}$. Thus

$$\boxed{\text{direct readout} \neq \text{canonical cross-junction certification.}}$$

This volume deliberately studies the second, weaker and theory-certified notion first.

4 The observation clock

A reader that orders observations needs a parameter that (i) exists globally, (ii) is monotone, and (iii) survives junctions. The frozen corpus offers three candidates, and two of them fail.

Proposition 4.1 (Why the naive clock choices are not frozen)**.** *The frozen 3.6 corpus does not provide either χ or σ_L as a canonical global observation clock.*

- *(i) The local arc coordinate χ* may be rebased *at a new arc entry. Hence its numerical value is chart-dependent across a hybrid history unless an additional global continuation convention is supplied.*
- *(ii) The variable σ_L is continuous through the canonical junction, but frozen 3.6 does not promote it to a globally strictly monotone, globally invertible history parameter. In particular, $\sigma_L \to 0$ in the cathartic/transformation regime is asymptotic for positive initial data unless finite-time hitting is separately proved.*

Thus neither variable is adopted here as the canonical ordering parameter of the reader.
[derived/typed from frozen 3.6]

Definition 4.2 (Adopted observation clock)**.** For the reader construction we adopt

$$\boxed{\tau_{\text{obs}} := \Theta_R = \sigma_L + I_R - G_{\text{recepta}} = \sigma_L + \lambda + \lambda_{\text{form}} - \Omega_P - G_{\text{recepta}}.}$$

This is an adopted reader convention based on a derived hybrid-continuous coordinate of 3.6. [adopted reader convention / derived basis]

Proposition 4.3 (Θ_R is hybrid-continuous and conditionally monotone)**.** *Frozen 3.6 proves $\dot{\Theta}_R = -\alpha\lambda$ on every smooth dwell arc and $\Theta_R^+ = \Theta_R^-$ through the canonical junction $\mathfrak{R}_{3.0}$. Therefore:*

- *(i) Θ_R gives one continuous scalar ordering across canonical resets;*
- *(ii) on every interval on which $\lambda > 0$, Θ_R is strictly decreasing;*
- *(iii) on intervals on which only $\lambda \geq 0$ is known, Θ_R is non-increasing and may stall where $\lambda = 0$;*
- *(iv) the no-self-return result of frozen 3.6 applies only on intervals where $\lambda > 0$.*

Thus hybrid continuity is unconditional within the stated canonical typing, while strict clock monotonicity remains conditional on $\lambda > 0$. *[derived / conditional]*

Proposition 4.4 (Exact arcwise form: the clock is an affine image of the Brim)**.** *Since $\dot{\Theta}_R = -\alpha\lambda$ and $\dot{\Omega}_P = \alpha\lambda$, the sum $\Theta_R + \Omega_P$ is constant on every dwell arc. Hence within the n-th arc*

$$\boxed{\Theta_R(t) = \Theta_R(t_n^+) - \big(\Omega_P(t) - \Omega_P(t_n^+)\big).}$$

Through $\mathfrak{R}_{3.0}$ the clock is continuous while $\Omega_P^+ = \Omega_P^- + \kappa_R G_{\text{reset}}$, so the arc constant changes by the corresponding Brim reset increment. Whenever a specified regime *proves that Ω_P grows without bound, Θ_R correspondingly decreases without bound. No global unboundedness claim is required for the definition of the reader clock itself.* [derived / regime-conditional]

▹ *Plain.* We need one measure by which to say "this was seen before that". The local arc coordinate may be reopened in a new chart, and resistance is not a canonical global clock. The quantity Θ_R, however, passes continuously through the canonical reset. Where Sophia remains positive it moves strictly in one direction. That makes it a natural observation clock for the reader, without claiming more than 3.6 proves.

5 Gauge compatibility

Proposition 5.1 (Forced $\mathbb{Z}_2$ invariance of any physical reader)**.** *Let $\mathfrak{g}$ denote the global transformation $q_{\text{fold}} \mapsto -q_{\text{fold}}$. Frozen 3.6 establishes that the absolute folding sign is a gauge: the scalar economy does not see it, it is not carried through π_R, there is no topological sign monodromy, and the adopted coupling satisfies $\mathcal{Q}_\Sigma[-q_{\text{fold}}] = \mathcal{Q}_\Sigma[q_{\text{fold}}]$ as a consequence of $f(s) = s^2$. Hence an admissible reader must satisfy*

$$\boxed{\mathcal{R}(\mathfrak{g}X) = \mathcal{R}(X),}$$

i.e. $\mathcal{R}$ factors as $X_{\text{core}}^{\text{union}} \to X_{\text{core}}^{\text{union}}/\mathbb{Z}_2 \to Y_{\text{obs}}$. The absolute folding sign is not an observable of 4.7. [derived from the frozen $\mathbb{Z}_2$ typing of 3.6]

Remark 5.2 (Global gauge quotient and the spatial wall)**.** The global $\mathbb{Z}_2$ action is $q_{\text{fold}}(\cdot) \mapsto -q_{\text{fold}}(\cdot)$. Its fixed field configuration is

$$q_{\text{fold}}(\cdot) \equiv 0.$$

This must not be confused with the spatial wall set of a nonzero field,

$$\Sigma_{\text{fold}}(\chi) = \{x : q_{\text{fold}}(\chi, x) = 0\}.$$

The latter is a subset of the living surface inside one field configuration; it is not the fixed locus of the $\mathbb{Z}_2$ action on the space of field configurations.

Under the global gauge transformation, $\mathcal{P}_+ \leftrightarrow \mathcal{P}_-$ while $\Sigma_{\text{fold}} \mapsto \Sigma_{\text{fold}}$. Hence the gauge-invariant morphological information is the unlabelled partition

$$\boxed{\{\mathcal{P}_+, \Sigma_{\text{fold}}, \mathcal{P}_-\}/(\mathcal{P}_+ \leftrightarrow \mathcal{P}_-).}$$

A physical reader may therefore report the wall set and the two-phase partition up to interchange, but may not assign physical meaning to the absolute labels "+" and "−".

No claim that the infinite-dimensional quotient $X_{\text{core}}^{\text{union}}/\mathbb{Z}_2$ is an orbifold is required at this stage; such a claim would require a separately specified configuration-space structure. [derived/typed]

▹ *Plain.* The two folded phases are mirror images, and the corpus has already proved that nothing in the vessel's own economy can tell which is which. So a reader is allowed to see *that* there are two phases and where the seam between them runs — and is forbidden to name one of them first.

6 The observability ledger

For each coordinate of $X_{\text{core}}^{\text{union}}$ the ledger records three independent facts, each imported from a frozen 3.6 result:

(A) Seen by π_R?
If yes, a reader observing it adds nothing beyond the reduced interface.

(B) Gauge-admissible?
If no, it cannot define a physical direct readout by Proposition 5.1.

(C) Interface-certified through $\mathfrak{R}_{3.0}$?
If no, frozen 3.6 does not uniquely transport its realized value through the canonical junction without an additional selection law.

Failure of (C) is a failure of *canonical cross-junction certification*, not a theorem that the realized value cannot be directly observed on a single slice.

Coordinate	**(A) in π_R**	**(B) $\mathbb{Z}_2$**	**(C) certified thru $\mathfrak{R}_{3.0}$**	**Ledger verdict**
σ_L	yes ($\sigma_R := \sigma_L$)	invariant	continuous	already at the interface
λ	yes	invariant	jump $+m_R$	already at the interface
u	yes (independent in X_R)	invariant	slaved to V, F	already at the interface
V, F	only through u	invariant	**no canonical jump law**	direct readout possible; **not certified across $\mathfrak{R}_{3.0}$**
Ω_P	no	invariant	jump $+\kappa_R G_{\text{reset}}$	**certified extra-interface**
λ_{form}	no	invariant	jump $+\Delta_{\text{emb}}$	**certified extra-interface**
G_{recepta}	no (conditional)	invariant	continuous	**certified extra-interface**
$H_K,\ W$	no	invariant	unresolved set-valued $\mathcal{J}_{KW}$	direct readout possible; **realized output not certified**
H_R	no	invariant	$\mathfrak{R}_{\text{core2}}$ namespace; not in $X_{3.0}^{\text{junction}}$	direct readout possible; **outside canonical certification**
$q_{\text{fold}}(\cdot)$ pointwise	no	**not invariant**	—	**inadmissible as absolute-sign readout**
$\mathcal{Q}_\Sigma[q_{\text{fold}}]$	no	invariant	post-junction amplitude fixed by λ^+	**certified extra-interface**

Coordinate	(A) in π_R	(B) $\mathbb{Z}_2$	(C) certified thru $\mathfrak{R}_{3.0}$	Ledger verdict
phase morphology up to swap	no	invariant	**post-junction morphology not selected**	gauge-readable; **not certified**
$I_R = \lambda + \lambda_{\text{form}} - \Omega_P$	no	invariant	*invariant*	**certified derived observable**
Θ_R	no	invariant	*continuous*	adopted as τ_{obs}
Ψ_{LM}	no	invariant	$\mathfrak{R}_{\text{LM}}$ only, not $\mathfrak{R}_{3.0}$	wrong namespace

Every cell of column (A) is imported from 3.6's classification of information; every cell of column (B) from its $\mathbb{Z}_2$ typing results; every cell of column (C) from its reset atlas, its canonical junction proposition, and the canonical invariant. [derived/typed]

Remark 6.1 (Morphology is gauge-admissible but not junction-complete)**.** The unlabelled phase morphology passes the $\mathbb{Z}_2$ test, but it does not pass the frozen cross-junction typing test. Frozen 3.6 fixes the post-junction gauge-invariant amplitude $\mathcal{Q}_\Sigma[q^+_{\text{fold}}] = q(\lambda^+)^2$, but explicitly leaves the morphology representative $[\varphi^+]$ unselected. Hence morphology is a legitimate instantaneous gauge-invariant object, but it is not yet a canonically orderable observable across $\mathfrak{R}_{3.0}$. [derived/typed]

7 What the ledger yields

Definition 7.1 (Extra-interface informative observable)**.** A gauge-admissible readout is *extra-interface informative* if it is not already determined by the reduced projection π_R. [proposed]

Theorem 7.2 (Finite-dimensional interface-certified scalar block)**.** *Relative to Definitions 3.2 and 7.1, the finite-dimensional scalar observables in the ledger that are both extra-interface informative and interface-certified are*

$$\boxed{Y_{\text{base}} = \big(\Omega_P, \lambda_{\text{form}}, G_{\text{recepta}}, \mathcal{Q}_\Sigma[q_{\text{fold}}]\big).}$$

The invariant $I_R = \lambda + \lambda_{\text{form}} - \Omega_P$ adds no independent scalar freedom once λ, λ_{form} and Ω_P are known. Thus Y_{base} is the natural finite-dimensional certified scalar block*. It is not the set of all possible direct-state observables.* *[derived / relative to the adopted certification rule]*

Proof. The coordinates σ_L, λ, u are already present at the reduced interface. The exact canonical reset certifies Ω_P, λ_{form} and G_{recepta}. The adopted spatial lift certifies the gauge-invariant amplitude $\mathcal{Q}_\Sigma[q^+_{\text{fold}}]$. The pointwise field $q_{\text{fold}}(\cdot)$ fails the gauge test. The ordered pair V, F has no canonical $\mathfrak{R}_{3.0}$ law. The realized H_K, W output remains selected only by the unresolved relation $\mathcal{J}_{KW}$. H_R lies outside the canonical $\mathfrak{R}_{3.0}$ namespace. The post-junction spatial morphology is unselected. Hence the certified extra-interface scalar block is exactly the one displayed. □

Remark 7.3 (What remains directly readable on a slice)**.** The theorem is a certification theorem, not a universal blindness theorem. On a single realized union state the labeled coordinates V, F, H_K, W, H_R are not removed by the folding gauge, and the unlabelled phase morphology is gauge-admissible. They are excluded from Y_{base} because their realized values are not certified across $\mathfrak{R}_{3.0}$.

7.1 The separation criterion, made well-posed

We fix $\boxed{\pi_{\text{int}} := \pi_R.}$

Corollary 7.4 (A nontrivial certified readout map can already be defined)**.** *The coordinate map $X \mapsto \Omega_P(X)$ is gauge-admissible, interface-certified and forgotten by π_R; therefore it separates at least some fibres of π_R. This establishes a nontrivial* candidate readout map*; it does not assert that a reader entity exists or occupies a physical position.* *[derived / relative]*

Proposition 7.5 (The substantive certification gaps)**.** *The ledger leaves three cross-junction certification gaps:*

(i) *V, F: no canonical $\mathfrak{R}_{3.0}$ jump law for the labeled pair;*
(ii) *H_K, W: a canonical set-valued relation exists, but the realized output is not selected by a frozen law;*
(iii) *the spatial morphology $[\varphi]$: the post-junction amplitude is fixed, but the morphology representative is not selected.*

The coordinate H_R is separate: it belongs to the raw $\mathfrak{R}_{\text{core2}}$ namespace rather than the active canonical $\mathfrak{R}_{3.0}$ state. *[derived/typed]*

Proposition 7.6 (Exponential contraction of the (V, F) asymmetry)**.** *Let $\Delta := V - F$. Frozen dwell dynamics gives $\dot{\Delta} = -(\mu a + \rho)\Delta$. Hence on any interval on which $\mu a + \rho \geq c > 0$,*

$$\boxed{|\Delta(t)| \leq |\Delta(t_0)|\, e^{-c(t-t_0)}.}$$

Thus the instantaneous asymmetry is exponentially contracted along the dwell flow. This is loss of practical resolving power, but not exact mathematical destruction at finite time: if $\Delta(t_0) \neq 0$, exponential contraction alone does not imply $\Delta(t) = 0$ at finite t. *[derived/conditional]*

Corollary 7.7 (Finite-resolution reading of the direct asymmetry channel)**.** *Assume a reader has finite asymmetry resolution $\varepsilon_{\text{obs}} > 0$ and that $\mu a + \rho \geq c > 0$ on the observed dwell interval. Then $|\Delta(t)| \leq \varepsilon_{\text{obs}}$ whenever*

$$\boxed{t - t_0 \;\geq\; \frac{1}{c} \log \frac{|\Delta(t_0)|}{\varepsilon_{\text{obs}}}.}$$

The symbol ε_{obs} is reserved for reader resolution and is deliberately distinct from the gate-memory coefficient η of the inherited Core 2.0 dwell subsystem. Therefore, after this resolution time, a reader limited to the instantaneous state cannot distinguish the earlier (V, F) asymmetry at precision ε_{obs}. A reader later required to report the earlier asymmetry must then either have retained a prior record or exploit some other observable channel that can be proved to encode the missing magnitude. This does not *imply* *that an ideal exact reader requires memory merely because Δ becomes small.* *[derived/conditional on finite resolution]*

▹ *Plain.* Will and act are driven toward alignment exponentially. Their difference does not become mathematically zero merely because it becomes very small. But any reader with finite resolution eventually loses the ability to recover the earlier split from the instantaneous state alone. Such a reader must have watched earlier and kept a record.

Remark 7.8 (Reader memory remains external to the Vessel)**.** If reader memory is later introduced, denote it by M_{obs}. It is a coordinate of the reader, not of $X^{\text{union}}_{\text{core}}$, and must not be silently identified with H_K, W or H_R. No dynamical law for M_{obs} is adopted in this volume. [proposed / unfrozen]

Proposition 7.9 ($\mathcal{J}_{KW}$ controls full canonical merger)**.** *Frozen 3.6's Reduced Canonical Fibre Theorem states that two canonical spatial junction relations admit a common post-junction state if and only if (i) $\Delta\sigma_L = \Delta G_{\text{recepta}} = \Delta I_R = 0$; (ii) the canonical event-difference equations are feasible; and (iii) the admissible gate-memory output sets overlap, $\mathcal{J}_{KW,A} \cap \mathcal{J}_{KW,B} \neq \varnothing$. Frozen 3.6 constructively closes event feasibility in its unbounded-G_{reset} domain. Therefore, once the reduced scalar conditions and event feasibility are satisfied, the unresolved condition for a* full canonical post-junction merger *is precisely gate-memory overlap. Conversely,*

$$\boxed{\mathcal{J}_{KW,A} \cap \mathcal{J}_{KW,B} = \varnothing \implies \textit{no full canonical post-junction merger}.}$$

No equivalence with reader separation *is asserted.* *[derived from frozen 3.6]*

Remark 7.10 (Merger and observability are different questions)**.** The coordinates controlled by $\mathcal{J}_{KW}$ are H_K and W. They are forgotten by π_R, but they are also absent from the finite scalar reader block Y_{base} because their canonical junction selection law remains unresolved. Therefore failure of $\mathcal{J}_{KW}$-overlap proves that the two full post-junction states cannot coincide. It does *not* by itself prove that the present reader can distinguish them. Hence

$$\boxed{\text{physical non-merger} \neq \text{observable separation}.}$$

This distinction is the central open door inherited by 4.7.

Open Question 1 (Full-history lift of scalar separation)**.** Do there exist full admissible histories $\Gamma_A \neq \Gamma_B$, glued by $\mathfrak{R}_{3.0}$ and evaluated at a common reader value $\tau_{\text{obs}} = \Theta^*_R$, whose reduced triples agree, $(\sigma_L, G_{\text{recepta}}, I_R)_A = (\sigma_L, G_{\text{recepta}}, I_R)_B$, while the certified scalar blocks differ, $Y_{\text{base}}(\Gamma_A) \neq Y_{\text{base}}(\Gamma_B)$?

The scalar $\mathfrak{R}_{3.0}$ algebra and the existence of a full $X^{\text{junction}}_{3.0}$ continuation are logically distinct. An affirmative scalar construction does not by itself prove that the corresponding gate-memory output sets admit realized outputs for both events. [open]

Open Question 2 (Selection-independent gate-memory observable)**.** For a specified admissible candidate relation $\mathcal{J}_{KW}$, let Q_{rel} denote the union of all of its nonempty admissible output sets, formalized in Definition 9.2. Assume the codomain Z contains at least two points. Does there exist a nonconstant functional $\Phi : Q_{\text{rel}} \to Z$ such that for every realizable prestate/event pair $(Y^-; E)$,

$$\boxed{\Phi(z_1) = \Phi(z_2) \quad \forall\, z_1, z_2 \in \mathcal{J}_{KW}(Y^-; E)\ ?}$$

Such a functional would be independent of which admissible gate-memory output is selected. The question is asked only on the *realized output support*: variation of Φ on outputs that no admissible event can realize does not count as an observable distinction. [open]

8 What the certified scalar block separates

This section determines what follows from the certified scalar algebra itself; it produces exact scalar separation statements, but it does not promote them to full $X_{3.0}^{\text{junction}}$ history theorems while $\mathcal{J}_{KW}$ remains unresolved.

8.1 The ledger–clock identity

Lemma 8.1 (Ledger–clock identity). *On the n-th dwell arc let $C_n = \sigma_L + \lambda + \lambda_{\text{form}} - \widehat{G}_n$ be the frozen local ledger constant and set $G_{\text{pre},n} := G_{\text{recepta}}(t_n^+)$, so that $G_{\text{recepta}} = G_{\text{pre},n} + \widehat{G}_n$ in the global-cumulative convention. Then*

$$\boxed{\Theta_R + \Omega_P = C_n - G_{\text{pre},n} =: \mathcal{K}_n.}$$

The arc constant of Proposition 4.4 is exactly the local ledger constant net of reception accumulated before entry. *[derived from frozen 3.6]*

Proof. From the ledger $\sigma_L + \lambda + \lambda_{\text{form}} = C_n + \widehat{G}_n$. Substituting into $\Theta_R = \sigma_L + \lambda + \lambda_{\text{form}} - \Omega_P - G_{\text{recepta}}$ gives $\Theta_R = C_n - G_{\text{pre},n} - \Omega_P$. ☐

Theorem 8.2 (Ledger-gap separation). *Let two scalar histories be evaluated at a common reader value $\tau_{\text{obs}} = \Theta_R^*$ on arcs with constants $\mathcal{K}_A, \mathcal{K}_B$. Then $\Omega_P(\Gamma_A) - \Omega_P(\Gamma_B) = \mathcal{K}_A - \mathcal{K}_B$, and therefore $\mathcal{K}_A \neq \mathcal{K}_B \Rightarrow Y_{\text{base}}(\Gamma_A) \neq Y_{\text{base}}(\Gamma_B)$.* *[derived]*

8.2 Two exact scalar constructions

Proposition 8.3 (Exact scalar junction separation with a ledger gap). *Fix one pre-junction scalar state and choose two admissible canonical event partitions $E_A = (G_A, m)$, $E_B = (G_B, m)$ with $G_A \neq G_B$ and $0 \leq m \leq \kappa_R \min\{G_A, G_B\}$. Immediately after the two scalar $\mathfrak{R}_{3.0}$ continuations,*

$$\Delta\sigma_L^+ = \Delta G_{\text{recepta}}^+ = \Delta I_R^+ = 0, \qquad \Delta\lambda^+ = 0,$$

while $\Delta\Omega_P^+ = \Delta\lambda_{\text{form}}^+ = \kappa_R(G_A - G_B)$. Hence the two scalar continuations share the reduced triple $(\sigma_L, G_{\text{recepta}}, I_R)$ and therefore the same reader value Θ_R^+, but differ in Y_{base}, with $\Delta\mathcal{K} = \Delta\Omega_P^+ = \kappa_R(G_A - G_B)$. *[derived at the exact scalar-$\mathfrak{R}_{3.0}$ level]*

Proposition 8.4 (The ledger gap is sufficient but not necessary). *Fix one pre-junction scalar state and one $G > 0$, but choose two distinct admissible partitions $E_A = (G, m_A)$, $E_B = (G, m_B)$ with $m_A \neq m_B$ and $0 \leq m_A, m_B \leq \kappa_R G$. Then $\Delta\Omega_P^+ = 0$ and $\Delta\mathcal{K} = 0$, while*

$$\Delta\lambda^+ = m_A - m_B, \qquad \Delta\lambda_{\text{form}}^+ = -(m_A - m_B).$$

The invariant I_R, the coordinates $\sigma_L, G_{\text{recepta}}$ and the reader value Θ_R still agree, while the λ_{form} component of Y_{base} differs. Therefore

$$\boxed{\Delta\mathcal{K} \neq 0 \textit{ is sufficient, but not necessary, for scalar separation.}}$$

[derived at the exact scalar-$\mathfrak{R}_{3.0}$ level]

Corollary 8.5 (What the scalar algebra does and does not close)**.** *The* scalar *part of Open Question 1 is answered affirmatively and analytically by Propositions 8.3 and 8.4; no numerical witness is required. Promotion to two full admissible $X_{3.0}^{\text{junction}}$ histories additionally requires that $\mathcal{J}_{KW}(Y^-; E_A)$ and $\mathcal{J}_{KW}(Y^-; E_B)$ admit realized outputs. Frozen 3.6 supplies no global non-emptiness or selection theorem for those sets. Therefore the full-history form of Open Question 1 is* reduced to the gate-memory lift*, not closed unconditionally.* *[derived / open lift]*

▷ *Plain.* The scalar algebra already gives two exact ways for histories to look the same on the reduced triple and different to the certified scalar reader. One comes from changing how much the Brim is renewed. The other comes from changing how the same renewal is divided between Sophia and form. What remains is not a scalar mystery: it is whether the unresolved gate-memory sector admits the corresponding full continuation.

8.3 Coincidence of the certified scalar reader

Theorem 8.6 (Scalar-block coincidence at a common reader time)**.** *Let two realized states be evaluated at the same reader value $\Theta_R = \Theta_R^*$. If they agree on σ_L and on $Y_{\text{base}} = (\Omega_P, \lambda_{\text{form}}, G_{\text{recepta}}, \mathcal{Q}_\Sigma)$, then they also agree on I_R, λ and $\mathcal{K}$, and therefore on every* scalar *coordinate of the canonical junction state. Differences may still remain in*

$$\boxed{(V, F) \textit{ individually}, \quad (H_K, W), \quad H_R, \quad [\varphi].}$$

These are residual degrees of freedom outside the certified scalar block. They are not thereby proved universally unobservable. *[derived]*

Proof. At common Θ_R^* we have $I_R = \Theta_R^* - \sigma_L + G_{\text{recepta}}$, so equality of σ_L and G_{recepta} gives equality of I_R. Then $\lambda = I_R - \lambda_{\text{form}} + \Omega_P$ gives equality of λ, and $\mathcal{K} = \Theta_R^* + \Omega_P$ gives equality of $\mathcal{K}$. The remaining listed quantities are precisely those not fixed by the certified scalar data. □

Remark 8.7 (Relative blindness only)**.** Theorem 8.6 characterizes coincidence for the *chosen certified scalar reader*. It does not say that a stronger direct-state reader could not distinguish some of the residual coordinates. In particular H_K, W and the labeled pair V, F are coordinates of the realized union state; the present obstacle is certification across the junction, not gauge inadmissibility.

8.4 The will/act interchange is a symmetry, not a gauge

Theorem 8.8 (Exact dwell equivariance under $V \leftrightarrow F$)**.** *For the frozen smooth dwell equations*

$$\dot{V} = \mu(aF + c\lambda) - \rho V, \qquad \dot{F} = \mu(aV + c\lambda) - \rho F, \qquad u = \sqrt{VF + \varepsilon},$$

the interchange $\mathfrak{s} : (V, F) \mapsto (F, V)$ is an exact symmetry of the dwell vector field. Swap-related initial states with all other coordinates equal generate swap-related dwell solutions, while all swap-invariant scalar coordinates evolve identically. No hybrid statement through $\mathfrak{R}_{3.0}$ is made, because frozen 3.6 supplies no canonical V, F jump law. *[derived from the imported frozen dwell equations]*

Remark 8.9 (Symmetry is not gauge)**.** The transformation $V \leftrightarrow F$ is a dynamical symmetry, not a frozen gauge identification. The union state contains *labeled* coordinates V and F, and frozen 3.6 never identifies $(V, F) \sim (F, V)$. Therefore an instantaneous direct-state readout of the ordered pair, or of $\Delta = V - F$, may distinguish the sign of the imbalance. What is swap-blind is the reduced/certified scalar reader, not the ontology itself.

$$\boxed{\text{dynamical symmetry } \neq \text{ gauge equivalence.}}$$

Corollary 8.10 (The certified scalar reader is swap-blind on dwell arcs)**.** *For two dwell solutions related by $\mathfrak{s}$ and otherwise identical, $\pi_R(X_A(t)) = \pi_R(X_B(t))$, $Y^A_{\text{base}}(t) = Y^B_{\text{base}}(t)$ and $\Theta^A_R(t) = \Theta^B_R(t)$ throughout their common smooth dwell interval. Hence the sign of $V - F$ is not recoverable from this particular scalar reader. This is a reader degeneracy, not a second $\mathbb{Z}_2$ gauge of the Vessel.* *[derived / reader-relative]*

Proposition 8.11 (Conditional sensitivity to the magnitude of the asymmetry)**.** *Let $P := VF$, $\Delta := V - F$ and $z := \Delta^2$. Then*

$$\dot{P} = \mu\big(a(z + 2P) + c\lambda\sqrt{z + 4P}\big) - 2\rho P,$$

and at fixed P, λ and coefficients,

$$\boxed{\frac{\partial \dot{P}}{\partial z} = \mu\left(a + \frac{c\lambda}{2\sqrt{z + 4P}}\right).}$$

Therefore, in any regime where this derivative is strictly positive, $|\Delta|$ leaves a strictly ordered imprint on the instantaneous evolution of $P = u^2 - \varepsilon$. This is a sensitivity result only. It does not *prove that two discrete reader samples uniquely reconstruct $|\Delta|$, nor does it remove the need for an explicit observation/inverse model.* *[derived / conditional]*

Remark 8.12 (status of the memory question)**.** The finite-resolution statement of Corollary 7.7 remains valid for the direct Δ-channel. Proposition 8.11 shows that other swap-invariant dynamics may carry information about $|\Delta|$ under additional conditions. Whether that information can actually be inverted from a specified observation stream is a separate inverse problem. This section therefore does *not* dissolve the reader-memory question.

▷ *Plain.* Whether a person's willing runs ahead of their doing, or their doing ahead of their willing, cannot be read by *this* reader — because the equations it watches treat the two cases alike. That is a limit of the instrument we have chosen, not a proof that the distinction does not exist.

9 The gate-memory sector

The scalar algebra leaves two distinct issues: the lift of the exact constructions through one full canonical junction, and Open Question 2. Both involve the unresolved gate-memory relation, but they depend on *different* properties of it:

$$\boxed{\begin{array}{c}\text{non-emptiness controls realizability,}\\ \text{overlap structure controls selection-independent certification.}\end{array}}$$

Throughout this section we fix one *admissible candidate relation* $\mathcal{J}_{KW}$ compatible with the gate-memory typing of frozen 3.6. This is a conditional structural analysis: frozen 3.6 does **not** select the canonical relation itself. The inherited statuses are J1 [imported] positivity, J2 [derived] global $\mathbb{Z}_2$ gauge constraint, J3 [proposed] null-event consistency, and J4 [proposed] reception-Lipschitz regularity; J3 and J4 are therefore invoked only conditionally. Write

$$Q := \{(H_K, W) \in \mathbb{R}^2 : \ H_K \geq 0,\ W \geq 0\}$$

for the ambient target quadrant required by J1.

9.1 Realizability and realized output support

Definition 9.1 (Realizable event relative to a candidate relation)**.** For the fixed candidate relation, an admissible canonical event $E = (G_{\text{reset}}, m_R)$ is *realizable at* Y^- if $\mathcal{J}_{KW}(Y^-; E) \neq \varnothing$. [proposed / definitional / relation-relative]

Definition 9.2 (Realized gate-memory support)**.** Let

$$\mathfrak{D}_{\mathcal{J}} := \big\{(Y^-, E) : E \text{ admissible},\ \mathcal{J}_{KW}(Y^-; E) \neq \varnothing\big\},$$

and set

$$\boxed{Q_{\text{rel}} := \bigcup_{(Y^-,E)\in\mathfrak{D}_{\mathcal{J}}} \mathcal{J}_{KW}(Y^-; E) \ \subseteq Q.}$$

Only points of Q_{rel} are realized gate-memory outputs for the fixed candidate relation. [proposed / definitional]

Remark 9.3 (non-emptiness is relation-relative)**.** If $\mathcal{J}_{KW}(Y^-; E) = \varnothing$ the fixed candidate supplies no output for that pair. Calling the event "unrealizable" is therefore relative to that candidate. Since frozen 3.6 does not select the canonical $\mathcal{J}_{KW}$, nothing here claims to know which positive events are realizable in the final theory.

Proposition 9.4 (Exact one-junction lift condition)**.** *Fix one full canonical prestate $Y^- \in X_{3.0}^{\text{junction}}$ whose scalar coordinates agree with the prestate used in either exact scalar construction. Conditional on the spatial lift adopted in 3.6, the two scalar events E_A, E_B extend to two full* post-junction outputs *of the canonical spatial relation if and only if*

$$\boxed{\mathcal{J}_{KW}(Y^-; E_A) \neq \varnothing, \qquad \mathcal{J}_{KW}(Y^-; E_B) \neq \varnothing.}$$

This closes the one-junction lift relative to the fixed candidate. It does not *by itself prove existence or continuation of two complete hybrid histories beyond that junction.[derived / conditional]*

Proof. The scalar post-junction coordinates are supplied exactly by those constructions, and the 3.6 spatial lift supplies an admissible folding-field output consistent with the post-λ amplitude. The remaining active junction coordinates are (H_K, W); a realized value for them exists precisely when the corresponding set is nonempty. Continuation away from the junction is a separate hybrid-existence problem. □

Proposition 9.5 (J1–J4 do not imply positive-event realizability)**.** *Even if the proposed J3 and J4 are adopted alongside J1 and J2, the four constraints do not imply $\mathcal{J}_{KW}(Y^-;E) \neq \varnothing$ for any event with $G_{\text{reset}} > 0$.* *[derived / no-go]*

Proof. Consider

$$\mathcal{J}_{\varnothing}(Y^-;E) = \begin{cases} \{(H_K^-, W^-)\}, & G_{\text{reset}} = 0, \\ \varnothing, & G_{\text{reset}} > 0. \end{cases}$$

It satisfies J1; it is independent of the global folding-sign representative, hence satisfies J2; at $G_{\text{reset}} = 0$ it satisfies the proposed J3 identity; and for positive events its output set is empty, so the proposed J4 inequality is vacuously satisfied. Thus J1–J4 are compatible with complete absence of positive-event outputs. □

Corollary 9.6 (Status of the full lift)**.** *The exact scalar constructions cannot be promoted to unconditional full canonical histories from the present 3.6 gate-memory constraints alone. Their scalar content is closed; their full one-junction realization remains a constitutive dependency on $\mathcal{J}_{KW}$.* *[derived]*

▹ *Plain.* The scalar transition can be exact while the full transition is still undecided. The missing question is not another scalar equation: it is whether the unresolved gate-memory relation allows any output at that event at all. The present constraints do not guarantee that it does.

9.2 Selection independence is a quotient problem

Definition 9.7 (Overlap relation on the realized support)**.** For $z, z' \in Q_{\text{rel}}$ define $z \sim z'$ if there exists a realizable pair $(Y^-;E) \in \mathfrak{D}_{\mathcal{J}}$ with $z, z' \in \mathcal{J}_{KW}(Y^-;E)$, and let $\sim^*$ be the equivalence relation generated by $\sim$. [proposed]

Theorem 9.8 (Certification quotient)**.** *Let Z contain at least two points. A functional $\Phi : Q_{\text{rel}} \to Z$ is selection-independent in the sense of Open Question 2 if and only if it is constant on every $\sim^*$-class. Consequently*

$$\boxed{\begin{array}{c} \textit{a nonconstant selection-independent } \Phi \textit{ exists on } Q_{\text{rel}} \\ \iff \\ Q_{\text{rel}}/\!\sim^* \textit{ has more than one element.} \end{array}}$$

[derived / relative to the fixed candidate relation]

Proof. Selection independence means Φ is constant on every nonempty $\mathcal{J}_{KW}(Y^-;E)$, hence along each generating relation and therefore on each generated class; the converse is immediate. If the quotient has at least two classes, assign two distinct values of Z to two classes; if it has one, every selection-independent functional is constant. □

Remark 9.9 (why the domain is Q_{rel}, not Q)**.** If Φ were defined on the ambient quadrant it could be made nonconstant merely by changing its value at a point belonging to no admissible output set. Such a distinction could never occur in a realized event, so nonconstancy outside Q_{rel} is not observable information.

Remark 9.10 (no regularity class has yet been imposed)**.** Theorem 9.8 is a *set-theoretic* result for unrestricted Φ. If a later reader theory requires Φ to be continuous, Lipschitz, smooth or measurable, then having more than one class remains necessary for nonconstancy but need not be sufficient. Such a requirement must be stated before a stronger physical observability theorem is claimed.

9.3 Two conditional regimes

Proposition 9.11 (Relative-fat regime: no nonconstant certificate)**.** *Assume Q_{rel} is connected in its relative topology and that every $z \in Q_{\mathrm{rel}}$ lies in the relative interior of some nonempty $\mathcal{J}_{KW}(Y^-;E)$ containing it. Then every $\sim^*$-class is relatively open in Q_{rel}; hence there is exactly one class and every selection-independent Φ is constant.* *[derived / conditional]*

Proof. Let w lie in one class. By assumption there is a relative neighbourhood $N_w \subseteq \mathcal{J}_{KW}(Y^-;E)$ for some realizable pair, so every point of N_w is $\sim$-related to w and lies in the same class. Thus each class is relatively open, and a connected space admits no partition into more than one nonempty disjoint open class. □

Proposition 9.12 (Singleton regime)**.** *Suppose every nonempty output set is a singleton $\mathcal{J}_{KW}(Y^-;E) = \{z(Y^-,E)\}$. Then every $\sim^*$-class in Q_{rel} is a singleton and every $\Phi : Q_{\mathrm{rel}} \to Z$ is selection-independent. If Q_{rel} and Z each contain at least two points, nonconstant selection-independent functionals exist. In this regime the output ambiguity has already been removed by the relation itself; Φ removes no remaining selection ambiguity.* *[derived / conditional]*

Corollary 9.13 (The unresolved object is the quotient)**.** *For a fixed candidate relation, the set-theoretic existence of a nonconstant selection-independent observable is determined exactly by $\boxed{Q_{\mathrm{rel}}/\sim^*.}$ Neither multivaluedness alone nor the geometric size of one individual output set decides it.* *[derived]*

9.4 J4 alone does not decide the quotient

Proposition 9.14 (The proposed J4 bound is topologically non-decisive)**.** *The 3.6-proposed condition $\|z^+ - z^-\| \le C_{KW}\kappa_R G_{\mathrm{reset}}$ is only an upper bound on the displacement permitted in one event. By itself it implies neither connectedness nor disconnectedness of the generated overlap quotient, and therefore cannot prove either existence or nonexistence of a nonconstant selection-independent Φ.* *[derived / no-go relative to proposed J4]*

Proof. Fix $C_{KW} > 0$. First let $\mathcal{J}_A(z^-;E) := \{z^-\}$; this satisfies J1 and J4, satisfies J3 if adopted, and has singleton classes. Second, on a toy admissible domain in which a positive event with reception $G_0 > 0$ is available at every $z^- \in Q$, choose $0 < r < C_{KW}\kappa_R G_0$ and set $\mathcal{J}_B(z^-;E_0) := Q \cap \overline{B}(z^-,r)$, null events remaining singleton-valued. This also satisfies J1 and the same J4 bound and may be chosen independent of the folding-sign representative, hence is compatible with J2. Since Q is convex, any two of its points are joined by a finite polygonal chain with steps shorter than r, so the generated relation is connected. The same J4 bound is thus compatible both with totally disconnected and with connected generated relations. Both are logical countermodels only; neither is proposed as the canonical law. □

Remark 9.15 (no numerical connectivity witness is admissible here)**.** Proposition 9.14 is an analytic no-go and requires no grid experiment. In particular, conclusions about the canonical overlap topology must not be drawn from a discretized reachability toy model: any such model fixes by fiat the very prestate spacing on which the answer turns.

9.5 Gauge consequence

Proposition 9.16 (Selection-independence gives a gauge-invariant candidate-certified value)**.** *Fix one admissible candidate relation $\mathcal{J}_{KW}$, let $\Phi : Q_{\mathrm{rel}} \to Z$ be selection-independent for it, and let $\Phi^\sharp(Y^-; E)$ denote its common value on $\mathcal{J}_{KW}(Y^-; E)$. The 3.6-derived J2 condition gives $\mathcal{J}_{KW}(Y^-; E) = \mathcal{J}_{KW}(\mathsf{g}Y^-; E)$ for the frozen global folding gauge, hence*

$$\boxed{\Phi^\sharp(\mathsf{g}Y^-; E) = \Phi^\sharp(Y^-; E).}$$

Thus the selection-independent value is gauge-invariant relative to the fixed candidate relation. *This does not yet make Φ a canonical 4.7 observable, because another admissible candidate may induce a different quotient and hence a different selection-independence condition.* *[derived from 3.6 J2 / candidate-relative]*

Remark 9.17 (null events, conditionally on J3)**.** If the *proposed* J3 is imposed on the fixed candidate, then at $G_{\mathrm{reset}} = 0$ one has $\mathcal{J}_{KW}(Y^-; E) = \{(H_K^-, W^-)\}$, contributing no nontrivial overlap edge. This depends on the proposed J3 consistency; it is not an imported frozen jump law.

10 What the gate-memory constraints leave undetermined

§9 showed that the gate-memory question has two layers: realizability, and selection-independent certification. This section asks how much the present J1–J4 constraint set determines either one. The answer is stronger than mere non-uniqueness, but it must be stated on the actual gate-memory prestate support.

10.1 The null-event support forced by J3

Definition 10.1 (Gate-memory prestate support)**.** Let

$$\boxed{Q_{\mathrm{pre}} := \left\{(H_K^-, W^-) : Y^- \in X_{3.0}^{\mathrm{junction}} \text{ an admissible canonical prestate}\right\} \subseteq Q.}$$

This is a property of the admissible prestate domain, not of any particular output relation. [typed / definitional]

Proposition 10.2 (J3 forces $Q_{\mathrm{pre}} \subseteq Q_{\mathrm{rel}}$)**.** *If the proposed null-event consistency J3 is imposed, then for every fixed candidate relation* $\boxed{Q_{\mathrm{pre}} \subseteq Q_{\mathrm{rel}}.}$ *[derived / conditional on proposed J3]*

Proof. For every admissible prestate with gate-memory coordinate z^- the null event is typed by $G_{\text{reset}} = 0$, $m_R = 0$, and J3 requires $\mathcal{J}_{KW}(Y^-; (0,0)) = \{z^-\}$. Hence every $z^- \in Q_{\text{pre}}$ occurs as a realized output. □

Remark 10.3 (why the support cannot be chosen independently)**.** An arbitrary $S \subseteq Q$ cannot simply be declared to be Q_{rel} while admissible prestates with gate-memory coordinates outside S remain in the domain: their null events would add those coordinates to Q_{rel}. Any realization theorem must therefore type the prestate support and the realized output support together. Reading J3 as vacuously satisfied by an empty output is not available, since it would mean the Vessel cannot persist through a null event at all.

10.2 Maximal quotient indeterminacy on a fixed prestate support

Definition 10.4 (Unbounded event-data domain over Q_{pre})**.** For the theorem below we use the same conditional event-data domain as the constructive feasibility result of 3.6: for every admissible prestate and every $G \geq 0$ the event $E_G := (G, 0)$ is admissible. Equivalently, the local event datum has no upper bound in G_{reset} and the choice $m_R = 0$ is allowed. [conditional domain inherited from the 3.6 feasibility chart]

Theorem 10.5 (Maximal quotient indeterminacy)**.** *Assume (i) the complete gate-memory prestate support is a fixed set $Q_{\text{pre}} = S \subseteq Q$; (ii) the event-data domain of Definition 10.4; (iii) J1 and J2 together with the proposed J3 and J4. Let $\mathcal{P}$ be* any *partition of S. Then there exists a candidate relation satisfying all four constraints, with a finite positive J4 witness constant, such that*

$$\boxed{Q_{\text{rel}} = S, \qquad Q_{\text{rel}}/\!\sim^* = \mathcal{P}.}$$

Moreover every admissible event at every prestate in S has a nonempty gate-memory output. *[derived / conditional on (i)–(iii)]*

Proof. Fix $C_* > 0$ to witness J4, and for $z \in S$ let $C(z) \in \mathcal{P}$ be its class. For admissible prestates with gate-memory coordinate $z^- \in S$ set

$$\mathcal{J}_{KW}(Y^-; (G_{\text{reset}}, m_R)) := \begin{cases} \{z^-\}, & G_{\text{reset}} = 0, \\ C(z^-) \cap \overline{B}\big(z^-,\, C_* \kappa_R G_{\text{reset}}\big), & G_{\text{reset}} > 0, \end{cases}$$

independent of m_R.

J1: all outputs lie in $S \subseteq Q$. *J2*: the construction depends only on the gauge-invariant coordinate z^- and on G_{reset}; the folding-sign representative never enters. *J3*: the null-event output is exactly $\{z^-\}$. *J4*: every positive-event output lies in the closed ball of radius $C_* \kappa_R G_{\text{reset}}$ about z^-, and the null-event displacement is zero.

Universal event realizability: z^- lies in its own class and at distance zero from itself, so $z^- \in \mathcal{J}_{KW}(Y^-; E)$ for every admissible E; no output set is empty.

Realized support: J3 gives $S = Q_{\text{pre}} \subseteq Q_{\text{rel}}$, and all outputs lie in S, so $Q_{\text{rel}} = S$.

Quotient: no output set meets two classes, since outputs from z^- lie in $C(z^-)$; hence $\sim^*$ never joins distinct classes. Conversely let $z, z' \in C$ for one class. By the unbounded event-data domain choose G with $C_* \kappa_R G \geq \|z' - z\|$; then $z, z' \in \mathcal{J}_{KW}(Y^-; (G, 0))$ for a prestate with coordinate z, so $z \sim z'$. The generated classes are therefore exactly those of $\mathcal{P}$. $\square$

Corollary 10.6 (Universal realizability still does not determine the quotient)**.** *Under the hypotheses of Theorem 10.5, adding the principle that $\mathcal{J}_{KW}(Y^{-}; E) \neq \varnothing$ for every admissible event does not narrow the quotient: every partition of the fixed support remains compatible with J1–J4 and with universal event realizability.* *[derived / conditional]*

Corollary 10.7 (No nonconstant canonical Φ follows from J1–J4)**.** *Assume $|S| \geq 2$. There is no nonconstant $\Phi : S \to Z$ whose selection independence can be guaranteed* uniformly for every candidate relation *allowed by Theorem 10.5. Indeed one allowed candidate realizes the one-class partition $\mathcal{P} = \{S\}$, and for that candidate every selection-independent Φ is constant. Hence J1–J4, even supplemented by universal event realizability, do not produce a nonconstant canonical gate-memory observable.* *[derived / canonical no-go]*

Corollary 10.8 (Relation-specific and canonical questions separate)**.** *For a* fixed *candidate relation Theorem 9.8 decides the set-theoretic question through $Q_{\mathrm{rel}}/\!\sim^{*}$. Across the whole J1–J4 candidate class, however, every partition of the fixed support is possible. Hence*

$$\boxed{\begin{array}{c}\textit{relation-specific existence of a nonconstant } \Phi \textit{ is candidate-dependent}, \\ \textit{a nonconstant canonical } \Phi \textit{ is not derivable from J1–J4}.\end{array}}$$

[derived / conditional]

Remark 10.9 (regularity of Φ does not change the quotient)**.** Choosing a regularity class for the reader functional — continuous, Lipschitz, smooth, measurable — may further restrict which functions on a *fixed* quotient are admissible. It does not alter $Q_{\mathrm{rel}}/\!\sim^{*}$ itself, and it cannot rescue a nonconstant canonical observable while the admissible relation class still contains a one-class quotient. The relation family must first be constitutively narrowed.

Remark 10.10 (the exact content of the theorem)**.** Theorem 10.5 is not a claim that the canonical gate-memory law is arbitrary. It is a statement about the present constraint class: under the stated prestate and event domain, J1–J4 plus even universal realizability permit every quotient partition of the fixed prestate support. The quotient cannot be selected by sharpening those constraints.

▹ *Plain.* The null event already tells us something: every gate-memory state that can occur before a transition must also appear among realized outputs. Once that typing is respected, the present constraints still leave the overlap structure completely free — and even requiring every event to have an outcome does not help. What is missing is not existence of an outcome, but a law saying which outcomes may belong to the same event.

11 Selection independence and conservation

The preceding section proves that the present gate-memory constraints do not select a nontrivial canonical observable. A narrower question remains:

When may selection-independent reading be interpreted as conservation through the canonical junction?

The answer is conditional. Conservation always implies selection independence; the converse requires an additional reflexivity property. This section therefore does *not* claim that the missing constitutive law is necessarily a conservation law. Throughout this section proposed J3 is assumed, so $Q_{\mathrm{pre}} \subseteq Q_{\mathrm{rel}}$ by Proposition 10.2, and the pre-junction gate-memory value of every admissible prestate lies in the domain of the functionals below.

11.1 Conservation and selection independence

Definition 11.1 (Gate-memory conservation law)**.** A functional $\Phi : Q_{\mathrm{rel}} \to Z$ is *conserved* by a fixed candidate relation if for every realizable pair $(Y^-; E)$ and every $z^+ \in \mathcal{J}_{KW}(Y^-; E)$, $\boxed{\Phi(z^+) = \Phi(z^-),}$ where $z^- = (H_K^-, W^-)$ is the gate-memory coordinate of Y^-.
[proposed / candidate-relative]

Proposition 11.2 (Conservation implies selection independence)**.** *Every conserved Φ is selection-independent for the same candidate relation.* *[derived]*

Proof. All outputs of one realizable event share the value $\Phi(z^-)$, so Φ is constant on $\mathcal{J}_{KW}(Y^-; E)$. □

Definition 11.3 (J6: gate-memory reflexivity)**.** A candidate relation satisfies J6 if for every realizable positive event $\boxed{z^- \in \mathcal{J}_{KW}(Y^-; E).}$ Together with proposed J3 at the null event, the incoming gate-memory point is one admissible output of every realizable event. [proposed]

Remark 11.4 (no nesting hypothesis is needed)**.** The converse below uses only self-inclusion. No monotone nesting of $\mathcal{J}_{KW}(Y^-; E_G)$ in G_{reset}, no small-event limit and no intersection condition is required for the logical equivalence; any such assumption would be additional constitutive structure.

Proposition 11.5 (Converse under J6)**.** *Assume proposed J3 and J6. Then every selection-independent Φ is conserved.* *[derived / conditional on proposed J3 and J6]*

Proof. For a positive realizable event J6 places z^- inside the same output set on which selection independence makes Φ constant, so every z^+ there satisfies $\Phi(z^+) = \Phi(z^-)$. At the null event the same follows from J3. □

Theorem 11.6 (Relation-specific equivalence under J6)**.** *For a fixed candidate relation satisfying proposed J3 and J6,*

$$\boxed{\begin{array}{c}\textit{a nonconstant selection-independent } \Phi \textit{ exists} \\ \Longleftrightarrow \\ \textit{the candidate relation conserves a nonconstant } \Phi \textit{ across } \mathfrak{R}_{3.0},\end{array}}$$

and by Theorem 9.8 such a quantity exists exactly when $Q_{\mathrm{rel}}/\sim^*$ has more than one class. *[derived / candidate-relative / conditional on proposed J3 and J6]*

Proof. Propositions 11.2 and 11.5, together with Theorem 9.8. □

Remark 11.7 (J6 changes the interpretation, not the quotient freedom)**.** Every relation constructed in Theorem 10.5 satisfies J6, since z^- belongs to each of its positive-event output sets. Therefore every partition allowed by Theorem 10.5 remains allowed after J6 is added, and for those examples functions of the partition class are both conserved and selection-independent. The construction realizes every possible quotient while satisfying J6; it is *not* a classification of all relations possessing conserved quantities.

Remark 11.8 (why J6 is a real extra assumption)**.** Without J6 selection independence need not imply conservation. Let one realizable event have incoming value z_0 and output set $\{z_1, z_2\}$ with $z_0 \notin \{z_1, z_2\}$, and choose $\Phi(z_1) = \Phi(z_2) \neq \Phi(z_0)$. Then Φ is selection-independent for that event but not conserved.

▹ *Plain.* A quantity can ignore which outcome was selected without necessarily being preserved from before the transition. Those become the same statement only when the incoming gate-memory state is itself one allowed outcome of every realized transition. That is the additional content of J6.

11.2 A lower-spread condition gives a sufficient negative closure

Definition 11.9 (J5: lower spread bound)**.** Assume proposed J3. A candidate relation satisfies J5 if there exists $c > 0$ such that for every admissible prestate and every admissible positive event,

$$\boxed{\mathcal{J}_{KW}(Y^-; E) \;\supseteq\; Q_{\mathrm{rel}} \cap \overline{B}\big(z^-,\, c\,\kappa_R G_{\mathrm{reset}}\big).}$$

[proposed]

Remark 11.10 (J5 already contains positive-event realizability)**.** By proposed J3, $z^- \in Q_{\mathrm{pre}} \subseteq Q_{\mathrm{rel}}$, and z^- lies at distance zero from itself, so the right-hand side is nonempty. Hence J5 forces every admissible positive event to have an output, and it implies J6. J5 is therefore substantially stronger than a mere realizability axiom.

Proposition 11.11 (J5 collapses the overlap quotient)**.** *Assume proposed J3, J5, and the unbounded event-data domain of Definition 10.4. Then $Q_{\mathrm{rel}}/\sim^*$ has exactly one class; consequently every selection-independent Φ is constant, and under J6 there is no nonconstant conserved gate-memory quantity.* *[derived / conditional on proposed J3 and J5]*

Proof. First let $z, z' \in Q_{\mathrm{pre}}$; by Proposition 10.2 both lie in Q_{rel}. At a prestate whose gate-memory coordinate is z, choose an admissible G_{reset} with $c\,\kappa_R G_{\mathrm{reset}} \geq \|z' - z\|$. By J5 both z and z' lie in $\mathcal{J}_{KW}(Y^-; E)$, so $z \sim z'$; hence all of Q_{pre} lies in one class.

Now let $y \in Q_{\mathrm{rel}}$. By Definition 9.2 it belongs to some realized output set whose incoming value z^- lies in Q_{pre}. For a null event J3 gives z^- in that set; for a positive event J5 gives the same, since $z^- \in Q_{\mathrm{rel}}$ at distance zero from itself. Thus $y \sim z^-$, and since every such z^- is already in the single class, so is y. □

Remark 11.12 (J5 is sufficient, not necessary)**.** A one-class quotient may arise from many relations not satisfying J5. Therefore $\neg$J5 does not imply that a nonconstant selection-independent observable exists. J5 is only one strong constitutive route to a negative answer.

Remark 11.13 (J4 and J5 are not a frozen dual pair)**.** J4 is proposed in 3.6 and J5 is newly proposed here. J4 gives an upper containment bound and J5 a lower one; their simultaneous consistency depends on the constants and on the realized support. No canonical duality theorem between them is claimed.

11.3 What this establishes

Proposition 11.14 (Two conditional closure routes)**.** *For the gate-memory certification problem: (i) a derived or explicitly adopted nonconstant conservation law is a sufficient positive route, since conservation implies selection independence; (ii) proposed J5 together with proposed J3 and the unbounded event-data domain is a sufficient negative route, since it forces a one-class quotient. Neither route is implied by J1–J4, and neither is claimed necessary.* *[derived / conditional]*

Remark 11.15 (structural precedent, not evidence)**.** The scalar sector of 3.6 carries the canonical invariant $I_R = \lambda + \lambda_{\text{form}} - \Omega_P$ through $\mathfrak{R}_{3.0}$. This shows only that conservation laws already occur in the corpus; it supplies no evidence that the gate-memory sector possesses an analogue.

▹ *Plain.* Nothing here proves that gate memory must conserve something. What is proved is a conditional equivalence: if the relation is reflexive in the sense of J6, then a selection-free reading is exactly a conserved quantity. A lower-spread law such as J5 would instead erase every such nonconstant distinction. Neither condition is inherited from frozen 3.6.

12 The implication structure of the proposed conditions

J5 was introduced as a sufficient negative closure and J6 as the condition under which selection independence may be re-read as conservation. A third possible constitutive idea is strict healing of the wound coordinate. These are *not* three mutually exclusive routes: their logical relation depends also on whether positive events are actually realizable. Write R_+ for the statement that at least one admissible positive event is realizable, and R_{all} for universal positive-event realizability. Neither is frozen by 3.6.

12.1 Exactly which functionals are conserved

Proposition 12.1 (Level-set characterization)**.** *Assume proposed J3. For a fixed candidate relation, $\Phi : Q_{\text{rel}} \to Z$ is conserved if and only if*

$$\boxed{\mathcal{J}_{KW}(Y^-; E) \subseteq \Phi^{-1}\big(\Phi(z^-)\big)}$$

for every realizable pair. Conservation means exactly that no realized output set crosses the level set of Φ determined by its incoming point. *[derived / candidate-relative]*

Proof. Definition 11.1 written as a set containment. □

Remark 12.2 (classification with respect to conservation only)**.** This classifies the output-set condition required for a *given* functional to be conserved. It does not classify admissible relations, since J1–J4, realizability, gauge typing and any later requirements must still be imposed separately. The §10 construction is one family realizing this geometry, not the general form of every conserving candidate.

12.2 J5 implies both realizability and J6

Proposition 12.3 (J5 implies universal realizability and J6). *Assume proposed J3 and J5. Then*

$$\boxed{\mathsf{J5} \Longrightarrow \mathsf{R}_{\mathrm{all}} \quad \textit{and} \quad \mathsf{J5} \Longrightarrow \mathsf{J6}.}$$

[derived / conditional on proposed J3 and J5]

Proof. By J3 and Proposition 10.2, $z^- \in Q_{\mathrm{pre}} \subseteq Q_{\mathrm{rel}}$. Its distance from itself is zero, so $z^- \in Q_{\mathrm{rel}} \cap \overline{B}(z^-, c\kappa_R G_{\mathrm{reset}})$, which J5 places inside $\mathcal{J}_{KW}(Y^-; E)$. Hence that set is nonempty and contains z^-. □

Corollary 12.4 (J5 validates the equivalence and trivializes it). *Assume proposed J3, J5 and the unbounded event-data domain. Then J6 holds, so Theorem 11.6 is available; but Proposition 11.11 gives a one-class quotient, so no nonconstant selection-independent and no nonconstant conserved functional exists. J5 is thus a sufficient negative closure of the certification problem.* *[derived / conditional]*

12.3 Strict healing and the failure of reflexivity

Definition 12.5 (J7: strict wound healing). A candidate relation satisfies J7 if for every realizable positive event and every output, $\boxed{W^+ < W^-.}$ [proposed]

Proposition 12.6 (J6 and J7 conflict only on a realizable positive event). *If a positive event is realizable, J6 and J7 cannot both hold for it:*

$$\boxed{\mathsf{J6} \wedge \mathsf{J7} \wedge \mathsf{R}_+ \Longrightarrow \perp.}$$

Without R_+*, both may hold vacuously.* *[derived]*

Proof. J6 requires $z^- = (H_K^-, W^-)$ to be an output, for which $W^+ = W^-$, contradicting J7. If no positive event is realizable, both universal statements range over the empty set. □

Proposition 12.7 (Strict healing excludes the wound floor from the prestate domain). *Assume J1, J7 and* $\mathsf{R}_{\mathrm{all}}$*. If an admissible prestate had* $W^- = 0$*, J7 would require* $W^+ < 0$ *while J1 requires* $W^+ \geq 0$*, so no positive event there is realizable. Hence*

$$\boxed{\mathsf{J1} \wedge \mathsf{J7} \wedge \mathsf{R}_{\mathrm{all}} \Longrightarrow \ Q_{\mathrm{pre}} \cap \{W = 0\} = \varnothing.}$$

[derived / conditional on proposed J7]

Corollary 12.8 (what J7 actually removes). *Under J7 and* R_+*, Theorem 11.6 cannot be invoked, because its J6 hypothesis fails on the realizable positive-event sector. This does* not *forbid conservation laws: a particular nonconstant* Φ *may still satisfy* $\Phi(z^+) = \Phi(z^-)$ *while* W *strictly decreases. What is lost is only the converse*

$$\boxed{\textit{selection independence} \Longrightarrow \textit{conservation}.}$$

Under J7, conservation remains a sufficient positive route to certification, but no longer an exhaustive interpretation of every selection-independent certificate. *[derived]*

Remark 12.9 (strict healing and conservation can coexist)**.** J7 constrains only the W coordinate. It does not exclude a functional of another combination of gate-memory coordinates from satisfying $\Phi(z^+) = \Phi(z^-)$; for instance a relation that never alters H_K while strictly decreasing W satisfies J1, J4 and J7 and conserves the nonconstant $\Phi = H_K$. Hence J7 $\not\Rightarrow$ absence of conserved quantities.

12.4 The implication lattice

Theorem 12.10 (Interaction of J5, J6, J7 and realizability)**.** *Assume proposed J3 and the unbounded event-data domain. Then:*

(i) J5 $\Rightarrow \mathsf{R}_{\mathrm{all}} \wedge$ J6 $\wedge$ $(Q_{\mathrm{rel}}/{\sim^*}$ *one class*$)$*; J5 is a sufficient negative closure.*
(ii) J6 alone does not narrow the quotient: the arbitrary-partition family of Theorem 10.5 already satisfies it. J6 only makes selection independence and conservation equivalent for a fixed candidate.
(iii) J7 $\wedge\, \mathsf{R}_+ \Rightarrow \neg$J6*: under realized strict healing the equivalence is unavailable, although individual conserved quantities may still exist.*
(iv) J5 and J7 are incompatible whenever the positive-event domain is nonempty, since J5 forces $\mathsf{R}_{\mathrm{all}}$ *and J6 while J7 conflicts with J6 on every realized positive event.*
(v) J6 and J7 are not contradictory when no positive event is realizable; there they coexist vacuously.

[derived / conditional]

Remark 12.11 (why this is not a trichotomy)**.** J5 is a strengthening that already implies J6, so they are not alternative routes; and J7 is not the negation of either, its conflict with J6 appearing only on realizable positive events. The correct structure is an implication lattice with a realizability condition:

$$\boxed{\text{J5} \implies \mathsf{R}_{\mathrm{all}} + \text{J6} + \text{one-class quotient}, \qquad \text{J7} \wedge \mathsf{R}_+ \implies \neg\text{J6}.}$$

Realizability is part of the diagram and cannot be suppressed.

Remark 12.12 (J7 does not decide the overlap quotient)**.** No theorem above proves that J7 alone makes $Q_{\mathrm{rel}}/{\sim^*}$ connected, disconnected, trivial or nontrivial. J7 constrains each output relative to the incoming wound coordinate, whereas the quotient is generated by co-realization among outputs. A separate argument is required before J7 may be assigned any quotient classification.

▹ *Plain.* The proposed laws are not three competing switches. A lower-spread law J5 already contains reflexivity J6 and forces every event to have an outcome, and it then collapses the reader's gate-memory distinction entirely. Strict healing J7 pulls the other way: whenever a positive transition actually occurs, the old gate-memory point cannot be one of the new states. That destroys the automatic equivalence between selection-free reading and preservation — but it does not prove that nothing is preserved. What is missing is not a choice among three labels; it is the actual geometry of the relation, together with a decision about which transitions occur at all.

13 The constitutive decision

Within the present J1–J4 and overlap-quotient route, the sections above reach a constitutive fork that cannot be removed by further manipulation of the same constraints. This section is therefore not another derivation from frozen 3.6. It is a decision, and its order is forced:

$$\boxed{\text{realizability regime} \longrightarrow \text{structure of the realized relation.}}$$

Realizability must come first because, by Theorem 12.10, the logical interaction of J6 and J7 depends on whether positive events are realizable at all. The adopted closure is

$$\boxed{\begin{array}{ll}\textbf{A:} & \text{typed (partial) positive-event realizability,}\\ \textbf{B:} & \text{J6 reflexivity on the realized domain.}\end{array}}$$

J5 and J7 remain available as future constitutive laws but are not adopted.

13.1 Typed positive-event realizability

Universal realizability is not justified: frozen 3.6 does not prove it, and by Corollary 10.6 it would not determine the overlap quotient in any case. Leaving realizability wholly open, however, would prevent 4.7 from promoting any scalar Resurrectio construction to a full junction event. We therefore type a realized domain.

Definition 13.1 (Realized positive-event domain)**.** Let $\mathfrak{D}^+_{\text{adm}}$ denote the set of pairs (Y^-, E) with $Y^- \in X^{\text{junction}}_{3.0}$, $E = (G_{\text{reset}}, m_R)$ canonically admissible and $G_{\text{reset}} > 0$. Choose a nonempty subset

$$\boxed{\varnothing \neq \mathfrak{D}_+ \subseteq \mathfrak{D}^+_{\text{adm}},}$$

adopted as the *exact realizable positive-event domain*. Accordingly,

$$\boxed{(Y^-, E) \in \mathfrak{D}^+_{\text{adm}} \setminus \mathfrak{D}_+ \implies \mathcal{J}_{KW}(Y^-; E) = \varnothing.}$$

Mathematically inadmissible event data lie outside the domain of the canonical relation altogether; admissible positive events outside $\mathfrak{D}_+$ are typed as unrealized. [proposed / adopted in 4.7]

Remark 13.2 (why the second clause is required)**.** Without it, a positive event outside $\mathfrak{D}_+$ could still have a nonempty output set. Its outputs would enter Q_{rel} while J6 was not asserted there, and the equivalence of Theorem 11.6 would fail on that sector: a functional could be constant on such an output set without agreeing with the incoming value. The clause makes "realizable positive event" and "member of $\mathfrak{D}_+$" coincide, which is what the results below require. It applies only inside the admissible positive-event domain and assigns no empty output sets to mathematically inadmissible event data.

Axiom 13.3 (Typed positive-event realizability)**.** For every $(Y^-, E) \in \mathfrak{D}_+$,

$$\boxed{\mathcal{J}_{KW}(Y^-; E) \neq \varnothing.}$$

No claim is made that every mathematically admissible positive event belongs to $\mathfrak{D}_+$. [proposed / adopted in 4.7]

Remark 13.4 (admissibility is not realizability)**.** The distinction admissible event $\neq$ realized event is intentional. The frozen scalar event inequalities say which event data are mathematically admissible; $\mathfrak{D}_+$ says which of those are assigned a full gate-memory realization. This section therefore does not convert algebraic admissibility into a universal existence theorem.

Remark 13.5 (how this closes the §8 scalar lift)**.** By Proposition 9.4, the one-junction lift of either exact §8 construction closes precisely when (Y^-, E_A) and (Y^-, E_B) both lie in $\mathfrak{D}_+$. Realizability has thus become a membership question rather than an open existence problem. It still does not prove continuation of the resulting states into complete global hybrid histories.

▹ *Plain.* Not every mathematically allowed resurrection is declared to happen. Instead a nonempty class of positive transitions is marked as genuinely realized, and those are required to have gate-memory outcomes. This gives the theory real positive events without inventing a universal existence theorem.

13.2 Gate-memory reflexivity

Axiom 13.6 (J6 on the realized positive-event domain)**.** For every $(Y^-, E) \in \mathfrak{D}_+$ the incoming gate-memory state remains one admissible post-junction output:

$$\boxed{z^- = (H_K^-, W^-) \in \mathcal{J}_{KW}(Y^-; E).}$$

[proposed / adopted in 4.7]

Remark 13.7 (J6 is not an identity reset)**.** The axiom does not state $z^+ = z^-$. It states only that z^- is *among* the admissible outputs; the relation may contain many others. J6 gives reflexivity of the relation, not deterministic memory preservation.

Remark 13.8 (why J6 rather than J5 or J7)**.** J5 is strictly stronger, since J5 $\Rightarrow$ J6 (Proposition 12.3), and it forces a negative answer in advance. J7 is not stronger but incompatible with J6 on realized positive events (Proposition 12.6), and it removes the conservation reading. J6 is thus the least committal condition identified here that makes selection-independent reading equivalent to conservation *without* fixing the quotient: the arbitrary-partition family of Theorem 10.5 already satisfies it, so J6 leaves open whether a nonconstant certificate exists. No order relation between J6 and J7 is claimed.

13.3 Consequences of the constitutive decision

Corollary 13.9 (The reader problem after the decision)**.** *Under proposed J3, Definition 13.1 and Axioms 13.3–13.6, the realizable positive events are exactly $\mathfrak{D}_+$ and J6 holds on all of them. Hence Theorem 11.6 applies, and a functional $\Phi : Q_{\mathrm{rel}} \to Z$ is selection-independent if and only if*

$$\boxed{\Phi(z^+) = \Phi(z^-) \ \textit{ for all } z^+ \in \mathcal{J}_{KW}(Y^-; E),\ (Y^-, E) \in \mathfrak{D}_+,}$$

together with the null-event sector supplied by J3. A nonconstant gate-memory certificate therefore exists exactly when the realized relation preserves more than one level set of some Φ. *[derived / conditional on the adopted axioms]*

Remark 13.10 (the answer remains undecided)**.** Adopting J6 does not produce such a Φ. By Theorem 10.5 the quotient is still free, so That decision does not solve the reader problem by axiom; it makes the problem well posed and fixes the language in which its answer must be stated.

▷ *Plain.* The old gate-memory state is not forced to survive as the actual outcome. It is only retained among the possible outcomes. That small reflexivity assumption is enough to turn the reader question into a question about what is preserved, while leaving open whether anything nontrivial is preserved at all.

13.4 The alternatives, and why they are not adopted

Remark 13.11 (J5 not adopted)**.** J5 would require a lower spread of admissible outputs. By Proposition 12.3 and Corollary 12.4 it implies universal realizability and J6 and collapses the quotient to one class, forcing a negative answer to the certification problem. No independent basis for its lower-spread geometry has been derived from frozen 3.6, and adopting it now would determine the reader result in advance rather than make the problem well posed. [proposed alternative / not adopted]

Remark 13.12 (J7 not adopted)**.** J7 would impose $W^+ < W^-$ on every realized positive event. This is a strong constitutive statement about the Vessel rather than a consequence of the reader formalism, and by Proposition 12.7 it would exclude the wound floor $W^- = 0$ from the prestate domain whenever realizability is universal. The present corpus supplies no derivation of strict healing as a universal law of positive Resurrectio, and That decision does not build semantic expectations about healing into the gate-memory algebra without a mathematical ground. This is not evidence against healing; by Corollary 12.8, J7 would not by itself forbid a conserved quantity either — a different combination of H_K and W could survive even if W strictly decreases. [proposed alternative / not adopted]

13.5 Adopted architecture and its consequences

$$\boxed{\begin{aligned}
&\mathfrak{D}_+ \neq \varnothing,\\
&(Y^-, E) \in \mathfrak{D}_+ \implies \mathcal{J}_{KW}(Y^-; E) \neq \varnothing,\\
&(Y^-, E) \in \mathfrak{D}_+ \implies z^- \in \mathcal{J}_{KW}(Y^-; E),\\
&(Y^-, E) \in \mathfrak{D}^+_{\mathrm{adm}} \setminus \mathfrak{D}_+ \implies \mathcal{J}_{KW}(Y^-; E) = \varnothing.
\end{aligned}}$$

Theorem 13.13 (Consequences of the adopted architecture)**.** *Under proposed J3 and the adopted axioms: (i) positive realized gate-memory events exist; (ii) every event in $\mathfrak{D}_+$ has at least one output; (iii) the incoming state is one admissible output of every such event; (iv) selection-independent gate-memory observables on the realized relation are exactly its conserved functionals; (v) the existence of a nonconstant such observable remains undecided; (vi) the overlap quotient remains constitutively open.* *[derived / conditional on the adopted axioms]*

Remark 13.14 (what is deliberately not adopted)**.** Universal positive-event realizability; a deterministic gate-memory selection law; J5; J7; any particular conserved functional; a fixed nontrivial overlap quotient; and global hybrid continuation from realized junction outputs.

14 The gate-memory dwell algebra

The constitutive decision makes the next question precise, but one methodological point must be fixed before any calculation:

$$\boxed{\text{a dwell first integral is not automatically a junction invariant.}}$$

The inherited smooth Core 2.0 gate-memory subsystem gives, with $x_0 := u - \sigma_L$ and $R_\pm := R((\dot{x}_0)_\pm)$,

$$\dot{H}_K = \eta R_+ - \nu R_- \frac{H_K}{H_s + H_K}, \qquad \dot{W} = \eta\Big[R_- - R_+ \frac{W}{W_s + W}\Big],$$

with $H_s, W_s, \eta, \nu > 0$. The two active transmissive directions carry exact but different first integrals.

Proposition 14.1 (Forward-transmissive dwell first integral)**.** *On an interval with $\dot{x}_0 > 0$, $R_+ > 0$ and $W > 0$,*

$$\boxed{\Phi_+(H_K, W) = H_K + W + W_s \ln \frac{W}{W_s}, \qquad \tfrac{d}{dt}\Phi_+ = 0.}$$

At $W = 0$ the logarithm is undefined, while the dwell equation itself gives $W(t) \equiv 0$ for as long as the forward-transmissive regime persists.[derived from the inherited Core 2.0 dwell subequations]

Proof. On an active forward interval $R_- = 0$, so $\dot{H}_K = \eta R_+$ and $\dot{W} = -\eta R_+ W/(W_s + W)$. Hence $\frac{d}{dt}\Phi_+ = \eta R_+ - \eta R_+ \frac{W}{W_s+W}\big(1 + \frac{W_s}{W}\big) = 0$. □

Proposition 14.2 (Backward-transmissive dwell first integral)**.** *On an interval with $\dot{x}_0 < 0$, $R_- > 0$ and $H_K > 0$,*

$$\boxed{\Phi_-(H_K, W) = W + \frac{\eta}{\nu}\Big(H_K + H_s \ln \frac{H_K}{H_s}\Big), \qquad \tfrac{d}{dt}\Phi_- = 0.}$$

At $H_K = 0$ the logarithm is undefined, while the dwell equation itself gives $H_K(t) \equiv 0$ for as long as the backward-transmissive regime persists. [derived from the inherited Core 2.0 dwell subequations]

Proof. On an active backward interval $R_+ = 0$, so $\dot{H}_K = -\nu R_- H_K/(H_s + H_K)$ and $\dot{W} = \eta R_-$. Hence $\frac{d}{dt}\Phi_- = \eta R_- + \frac{\eta}{\nu}\big(1 + \frac{H_s}{H_K}\big)\big(-\nu R_- \frac{H_K}{H_s+H_K}\big) = 0$. □

Remark 14.3 (normalized logarithms)**.** The forms $W_s \ln(W/W_s)$ and $H_s \ln(H_K/H_s)$ give the logarithm a dimensionless argument; replacing them by $W_s \ln W$ and $H_s \ln H_K$ changes the first integrals only by additive constants.

Remark 14.4 (the two dwell invariants are genuinely different)**.** The forward and backward sectors generate different level-set foliations. Both identities follow analytically from the dwell equations; no numerical trajectory is required for either proof. Neither expression is therefore promoted to a universal history or junction invariant merely because it is exact on one branch.

Proposition 14.5 (Two-direction algebraic obstruction)**.** *On the open quadrant* $Q^\circ := \{H_K > 0,\ W > 0\}$*, strip the positive scalar rate factors from the two active direction fields:*

$$v_+ = \Big(1,\ -\tfrac{W}{W_s+W}\Big), \qquad v_- = \Big(-\tfrac{\nu}{\eta}\tfrac{H_K}{H_s+H_K},\ 1\Big).$$

Their determinant is

$$\boxed{D(H_K, W) = 1 - \frac{\nu}{\eta}\,\frac{H_K}{H_s+H_K}\,\frac{W}{W_s+W}.}$$

At every point where $D \neq 0$ *the two directions are linearly independent, so any* C^1 *functional required to be conserved under both there must satisfy* $\nabla\Phi = 0$*.* *[derived / local algebraic statement]*

Corollary 14.6 (No common C^1 first integral of both algebraic direction fields)**.** *For every finite positive choice of* η, ν, H_s, W_s*, a* C^1 *functional* $\Phi : Q^\circ \to \mathbb{R}$ *conserved under both* v_+ *and* v_- *at every point of* Q° *is constant. No specialization such as* $\nu = \eta$ *is required for this algebraic statement.* *[derived / algebraic]*

Proof. If $\nu \le \eta$ then $D > 0$ throughout Q°, since both fractions lie strictly in $(0,1)$. If $\nu > \eta$, the equation $D = 0$ reads $\frac{H_K}{H_s+H_K}\frac{W}{W_s+W} = \frac{\eta}{\nu}$; for fixed $H_K > 0$ the left side is strictly increasing in W, so the zero set contains at most one W per H_K and has empty interior. In either regime $\{D \neq 0\}$ is dense in Q°, so $\nabla\Phi = 0$ there by Proposition 14.5; continuity of $\nabla\Phi$ extends this to all of Q°, and connectedness gives constancy. □

Remark 14.7 (what the algebraic no-go does not prove)**.** Corollary 14.6 concerns a functional required to respect *both algebraic direction fields throughout the same open quadrant*. It does not prove that the full Vessel dynamics realizes both signs of $\dot{x}_0$ over the same gate-memory points. That is a reachability question in the larger state space, and the two-dimensional subsystem alone does not answer it.

Proposition 14.8 (the coordinate floors are direction-dependent)**.** *On an active forward interval* $W = 0$ *is invariant, while a state with* $H_K = 0$ *and* $R_+ > 0$ *immediately leaves that floor since* $\dot{H}_K = \eta R_+ > 0$*. On an active backward interval* $H_K = 0$ *is invariant, while a state with* $W = 0$ *and* $R_- > 0$ *immediately leaves it since* $\dot{W} = \eta R_- > 0$*. Neither coordinate floor is therefore a regime-independent boundary certificate. No claim is made that no other invariant subset of the full dwell system exists.* *[derived / regime-conditional]*

Proposition 14.9 (Dwell conservation does not certify Resurrectio conservation)**.** *Let* $\Phi(H_K, W)$ *be any exact first integral of a smooth dwell regime. Nothing in the present junction typing implies* $\Phi(z^+) = \Phi(z^-)$ *for* $z^+ \in \mathcal{J}_{KW}(Y^-; E)$*; that is an additional property of the junction relation. The dwell equations can generate candidate level-set geometries but do not close the certification problem by themselves.* *[typing consequence / no-go]*

Remark 14.10 (what the §10 freedom still means)**.** In the fixed-support, unbounded-event chart of Theorem 10.5, any partition of the support can still be realized by a J1–J4 candidate satisfying the §13 reflexivity choice. An algebraically attractive dwell first integral therefore does not identify the canonical junction invariant by itself. The missing information is a relation between the full dwell dynamics and the canonical junction law.

Open Question 3 (Dwell–junction compatibility)**.** Is there an independently justified condition connecting the inherited Core 2.0 gate-memory dwell flow to the canonical relation $\mathcal{J}_{KW}$ strongly enough to privilege Φ_+, Φ_-, a common function of them, or another nonconstant level-set geometry? No such bridge is adopted here. [open]

Remark 14.11 (why a bridge is necessary)**.** A junction is not an infinitesimal continuation of a dwell arc merely by definition, so even an exact dwell first integral has no automatic right to survive $\mathfrak{R}_{3.0}$. A statement $\Phi(z^+) = \Phi(z^-)$ must come either from the canonical junction law itself or from an explicitly adopted dwell–junction compatibility principle. Without such a bridge, importing a dwell invariant into $\mathcal{J}_{KW}$ would be a new constitutive assumption disguised as a derivation.

▹ *Plain.* Smooth gate-memory motion really does preserve exact combinations, but a different one in each active transmission direction. The two-dimensional algebra also shows that no single nonconstant smooth function can obey both direction fields everywhere. That is a strong result, but it is not yet a theorem about the actual Vessel trajectory: first we must know where each direction is dynamically reachable.

15 Directional reachability

The dwell algebra closes the purely algebraic part of the calculation. It does *not* close the dwell route to a certificate, because a direction-independent algebraic no-go and an actual-flow no-go are different statements. The missing object is the directional reachability geometry of the full dwell state.

Definition 15.1 (Projected directional dwell supports)**.** Let $\pi_{KW}(X) := (H_K(X), W(X))$ and define

$$Q_+^{\mathrm{dw}} := \{z \in Q^\circ : \exists\, X \text{ admissible smooth dwell point},\ \pi_{KW}(X) = z,\ \dot{x}_0(X) > 0,\ R_+(X) > 0\},$$

$$Q_-^{\mathrm{dw}} := \{z \in Q^\circ : \exists\, X \text{ admissible smooth dwell point},\ \pi_{KW}(X) = z,\ \dot{x}_0(X) < 0,\ R_-(X) > 0\}.$$

These are projections from the full dwell state space; they do not assume that $\operatorname{sgn} \dot{x}_0$ is determined by (H_K, W) alone. [proposed / diagnostic]

Proposition 15.2 (What an actual-flow invariant must satisfy)**.** *Let $\Phi : Q^\circ \to \mathbb{R}$ be C^1 and conserved along every admissible smooth dwell trajectory. Then $v_+ \cdot \nabla\Phi = 0$ on Q_+^{dw} and $v_- \cdot \nabla\Phi = 0$ on Q_-^{dw}; on $Q_+^{\mathrm{dw}} \cap Q_-^{\mathrm{dw}}$ both hold, and where $D \neq 0$ there, $\nabla\Phi = 0$.* *[derived / conditional on directional reachability]*

Corollary 15.3 (Open-overlap obstruction)**.** *If $U \subseteq Q_+^{\mathrm{dw}} \cap Q_-^{\mathrm{dw}}$ is a nonempty connected open set, then every C^1 functional conserved along all admissible dwell trajectories is constant on U.* *[derived / conditional]*

Proof. The zero set of D has empty interior by the proof of Corollary 14.6, so $U \cap \{D \neq 0\}$ is dense in U; Proposition 15.2 gives $\nabla\Phi = 0$ there, continuity extends it to U, and connectedness gives constancy. $\square$

Remark 15.4 (why §14 did not already close the actual-flow problem)**.** If the projected supports are disjoint, or meet only on a thin switching set, the determinant argument does not rule out a nonconstant function following different first-integral geometry in different reachable regions. Whether such a function can be made globally C^1, or even continuous, depends on the switching and reachability geometry of the *full* dwell system, which the isolated (H_K, W) subsystem does not supply.

Proposition 15.5 (The junction typing does not select a dwell branch)**.** *The canonical event datum $E = (G_{\mathrm{reset}}, m_R)$ contains no explicit forward/backward selector, and the adopted canonical source set contains no theorem that $\operatorname{sgn} \dot{x}_0^-$ is recoverable from the declared canonical prestate Y^-. Therefore the canonical typing does not justify privileging Φ_+ over Φ_-, or conversely.* *[typing result / source limitation]*

Remark 15.6 (a direction-indexed bridge is not impossible)**.** The proposition does *not* say that a direction-indexed junction law is structurally impossible. Such a bridge would become well typed if one supplied $s_{\mathrm{dw}} : \mathfrak{D}_+ \to \{+, -\}$ as an explicit constitutive selector, or proved that such a selector is derivable from the existing pre-junction state. No such selector or derivation is part of the adopted junction typing, so a direction-indexed bridge would be new content rather than a consequence of §14.

Open Question 4 (Directional reachability and selector)**.** Determine (i) the projected sets Q_+^{dw} and Q_-^{dw}; (ii) whether their intersection has nonempty interior; (iii) whether $\operatorname{sgn} \dot{x}_0^-$ is determined by the existing canonical prestate Y^-; and (iv) if it is, whether the resulting selector supplies an independently justified dwell–junction compatibility law. [open]

16 The transmission-rate selector

§15 identified two unresolved issues: directional reachability in the full dwell state, and the typing of a possible pre-junction direction selector. The selector is derived algebraically below. That does *not* by itself prove that both signs are realized over the same gate-memory region.

16.1 The transmission rate in closed form

Proposition 16.1 (Closed form of $\dot{x}_0$)**.** *For the frozen Core 2.0 dwell equations $\dot{V} = \mu(aF + c\lambda) - \rho V$, $\dot{F} = \mu(aV + c\lambda) - \rho F$ with $\mu = 1 - u/\Omega_P$, $u = \sqrt{VF + \varepsilon}$ and $\dot{\sigma}_L = (\gamma - \delta u)\tanh(\kappa\sigma_L)$, write $P := VF = u^2 - \varepsilon$ and $z := (V - F)^2$. Then*

$$\boxed{\dot{x}_0 = \frac{\dot{P}}{2u} - (\gamma - \delta u)\tanh(\kappa\sigma_L), \qquad \dot{P} = \mu\big(a(z + 2P) + c\lambda\sqrt{z + 4P}\big) - 2\rho P.}$$

[derived from the frozen Core 2.0 dwell equations]

Proof. $\dot{P} = F\dot{V} + V\dot{F} = \mu(a(V^2 + F^2) + c\lambda(V + F)) - 2\rho VF$; substitute $V^2 + F^2 = z + 2P$, $V + F = \sqrt{z + 4P}$ and $\dot{u} = \dot{P}/(2u)$. □

Remark 16.2 (cross-check with §8)**.** The expression for $\dot{P}$ is the same algebra that appears in Proposition 8.11. This section introduces no new dwell equation; it re-expresses the frozen system in variables adapted to the direction question.

16.2 What the asymmetry does — and does not — determine

Proposition 16.3 (Asymmetry sensitivity of the transmission rate)**.** *At fixed $P, \lambda, \Omega_P, \sigma_L$,*

$$\boxed{\frac{\partial \dot{x}_0}{\partial z} = \frac{\mu}{2u}\left(a + \frac{c\lambda}{2\sqrt{z + 4P}}\right).}$$

Hence on any live-domain interval with $\mu > 0$ and $a + c\lambda/(2\sqrt{z + 4P}) > 0$, the transmission rate is strictly increasing in $z = (V - F)^2$. With $a > 0$ and $c \geq 0$, $\lambda \geq 0$ is sufficient for the bracket to be positive. *[derived / regime-conditional]*

Remark 16.4 (the $\lambda \geq 0$ regime is conditional)**.** Frozen 3.6 supplies a sufficient condition for positive invariance of $\{\lambda \geq 0\}$; it does not promote non-negative Sophia to an unconditional global axiom. Strict monotonicity in z is therefore stated with its actual sign condition rather than assumed globally.

Corollary 16.5 (Threshold classification)**.** *Fix $P, \lambda, \Omega_P, \sigma_L$ and let $I \subseteq [0, \infty)$ be a connected admissible interval of asymmetry values on which Proposition 16.3 is strict. Then $z \mapsto \dot{x}_0(z)$ has at most one zero in I, and if $z^* \in I$ exists then $\dot{x}_0 < 0$ for $z < z^*$ and $\dot{x}_0 > 0$ for $z > z^*$.* ***Existence of z^* is not automatic.*** *If $I = [0, \infty)$ and monotonicity holds throughout, then $\dot{x}_0(0) < 0$ is sufficient for a unique threshold, since the az term forces $\dot{x}_0 \to +\infty$ as $z \to \infty$ on the live domain; if $\dot{x}_0(0) \geq 0$ there is no backward branch on that fibre.* *[derived / conditional]*

Proposition 16.6 (Synergy does not determine the transmission rate)**.** *Fix $u, \sigma_L, \lambda, \Omega_P$ in a regime where Proposition 16.3 is strict. Then $P = u^2 - \varepsilon$ is fixed while $\dot{x}_0$ still varies with z. The* rate *is therefore not determined by u alone, nor by π_R or Y_{base}. The stronger statement about its* sign *is conditional: the reduced data fail to determine the sign only on fibres whose admissible z-range straddles a threshold of Corollary 16.5.* *[derived / conditional]*

Remark 16.7 (no numerical crossing is used)**.** The threshold statements are analytic. A numerical parameter choice may lie entirely in the forward regime, entirely in the backward regime, or straddle a unique threshold. A failed or successful numerical root search illustrates one fibre only and is not evidence for generic bidirectional reachability.

16.3 The exact reachability condition

Definition 16.8 (Admissible asymmetry fibre)**.** For $q = (H_K, W) \in Q^\circ$ and fixed scalar data $\xi := (P, \sigma_L, \lambda, \Omega_P)$, let $\mathcal{I}_z(q; \xi) \subseteq [0, \infty)$ consist of those z for which there exists an admissible full dwell state X with $\pi_{KW}(X) = q$, $(P, \sigma_L, \lambda, \Omega_P)(X) = \xi$ and $(V - F)^2(X) = z$. [proposed / diagnostic]

Proposition 16.9 (Threshold-straddling reachability criterion)**.** *Let $q \in Q^\circ$ and fix ξ in a regime satisfying Proposition 16.3. If the transmission rate has a threshold z^* and $\mathcal{I}_z(q;\xi)$ contains values $z_- < z^* < z_+$, then* $\boxed{q \in Q_+^{\text{dw}} \cap Q_-^{\text{dw}}.}$ *[derived / exact conditional criterion]*

Proof. The two admissible full states realizing z_- and z_+ share the gate-memory projection q, and by Corollary 16.5 their transmission rates have opposite signs. □

Corollary 16.10 (Open-overlap criterion)**.** *If there is a nonempty open $U \subseteq Q^\circ$ every point of which satisfies the threshold-straddling condition, then $U \subseteq Q_+^{\text{dw}} \cap Q_-^{\text{dw}}$, and every C^1 actual-flow dwell invariant is constant on each connected component of U by Corollary 15.3.* *[derived / conditional]*

Remark 16.11 (why a fibre-independence hypothesis is insufficient)**.** Merely requiring that each fixed (H_K, W) fibre project onto *some* open set of the remaining coordinates does not imply that this open set crosses $\dot{x}_0 = 0$. The correct condition is sign-richness, equivalently threshold straddling in the monotone regime.

Remark 16.12 (local collapse is not global closure)**.** Even if $Q_+^{\text{dw}} \cap Q_-^{\text{dw}}$ contains a nonempty open set, a global conserved functional could be constant there and vary on dynamically separate regions. A global no-go requires a stronger coverage statement.

Corollary 16.13 (One sufficient global closure criterion)**.** *If Q° is the relevant connected gate-memory dwell domain and $Q_+^{\text{dw}} \cap Q_-^{\text{dw}}$ is dense in Q°, then every C^1 functional conserved along all admissible dwell trajectories is constant on Q°.* *[derived / conditional]*

16.4 The selector is a union-state quantity, not a junction datum

Definition 16.14 (Full-state dwell-direction selector)**.** At every smooth union-state point where $\dot{x}_0$ is defined, set $\boxed{s_{\text{dw}}^{\text{union}}(X) := \operatorname{sgn} \dot{x}_0(X).}$ This is a gauge-invariant direct-state functional, since the folding sign does not enter Proposition 16.1. [derived / direct-state]

Proposition 16.15 (The junction typing does not contain the selector)**.** *Frozen 3.6 distinguishes $X_{\text{core}}^{\text{union}} = (V, F, \sigma_L, \lambda, \lambda_{\text{form}}, \Omega_P, H_K, W, G_{\text{recepta}}, H_R; q_{\text{fold}})$ from the active canonical junction state*

$$X_{3.0}^{\text{junction}} = \big(\sigma_L, \lambda, \lambda_{\text{form}}, \Omega_P, G_{\text{recepta}}, H_K, W;\ q_{\text{fold}}(\cdot)\big),$$

which does not contain V, F. By Proposition 16.1 the selector generally depends on the omitted asymmetry $z = (V - F)^2$. Therefore the junction typing supplies no canonical map

$$\boxed{s_{\text{dw}}^- : X_{3.0}^{\text{junction}} \longrightarrow \{-1, 0, +1\}}$$

representing the pre-junction dwell direction. This is a domain-typing *obstruction, not a proof that the selector is unreadable on $X_{\text{core}}^{\text{union}}$.* *[derived / typed from frozen 3.6]*

Remark 16.16 (what would make a direction-indexed bridge well typed)**.** Any one of the following genuinely new structures would suffice: (i) an explicit pre-junction selector s_{dw}^- added to the junction data; (ii) a justified reader-domain lift recovering the required union information from the active junction state; (iii) a stronger extension of the canonical junction law carrying V, F through the transition. The third is sufficient but stronger than necessary, so a canonical (V, F) jump law is *not* the minimal missing ingredient.

Proposition 16.17 (A direction-indexed bridge would be new constitutive content)**.** *If 4.7 adopts a junction law selecting Φ_+ or Φ_- by a newly typed s^-_{dw}, that bridge may be perfectly well defined and certifiable relative to the enlarged junction law. What frozen 3.6 does not provide is the selector or lift needed to type that law in the first place.[typing consequence]*

Remark 16.18 (the loop closes on the reader-domain lift)**.** The same hidden (V, F) subfibre that §8 found absent from the reduced interface enters the pre-junction direction selector through $z = (V - F)^2$. The obstruction is therefore an object frozen 3.6 already exports by name: the lift $X^{\mathrm{junction}}_{3.0} \to X^{\mathrm{union}}_{\mathrm{core}}$. The first blocked cell of the ledger and the last obstruction of the volume meet on that export, not on a jump law of this volume's own invention.

Open Question 5 (Threshold reachability and junction selector)**.** Determine (i) where the admissible asymmetry fibres $\mathcal{I}_z(q; \xi)$ straddle the threshold surface $\dot{x}_0 = 0$; (ii) whether $Q^{\mathrm{dw}}_+ \cap Q^{\mathrm{dw}}_-$ is dense, connected, or otherwise sufficient to force a global actual-flow no-go; and (iii) whether the canonical junction state admits a prestate lift or selector carrying s^-_{dw}. [open]

17 Bidirectional dwell accessibility

The selector analysis reduced the directional problem to threshold straddling of the hidden asymmetry $z = (V - F)^2$. This section determines that straddling from the frozen instantaneous domain and the non-compact (V, F) fibre. One distinction is essential throughout:

$$\boxed{\text{instantaneous admissibility } \neq \text{ global hybrid reachability.}}$$

For the dwell-invariant question global reachability is not needed; local smooth arcs through admissible interior states suffice.

17.1 The instantaneous coordinate domain

Proposition 17.1 (Instantaneous product domain)**.** *Import the frozen Core 2.0 live-domain declaration*

$$\mathcal{D}_{\mathrm{live}} = \big\{(V, F, \sigma_L, \lambda, \Omega_P) : V > 0,\ F > 0,\ \sigma_L \geq 0,\ \Omega_P > \Lambda_c,\ 0 < u < \Omega_P\big\},$$

with the gate-memory sector typed on $Q = \{H_K \geq 0,\ W \geq 0\}$. No algebraic admissibility constraint in that declaration couples (H_K, W) to $(V, F, \sigma_L, \lambda, \Omega_P)$. Hence the instantaneous coordinate domain used in the dwell analysis is

$$\boxed{\mathcal{D}_{\mathrm{inst}} = \mathcal{D}_{\mathrm{live}} \times Q,}$$

so every admissible $\xi = (P, \sigma_L, \lambda, \Omega_P)$ is available at every $q \in Q$. [imported/typed from frozen Core 2.0]

Remark 17.2 (dynamical coupling does not alter the coordinate product)**.** The chain $H_K \to g_{\text{eff}} \to I_{\text{gate}} \to \dot{\lambda}$ is a dynamical coupling: it changes the vector field but adds no algebraic exclusion to $\mathcal{D}_{\text{inst}}$. Proposition 17.1 is a statement about admissible instantaneous coordinates, *not* a factorisation of complete trajectories.

17.2 The asymmetry fibre is maximal

Proposition 17.3 (Exact asymmetry fibre)**.** *Fix $P = u_0^2 - \varepsilon > 0$. Frozen 3.6 gives the hidden subfibre $\{(V, F) \in \mathbb{R}^2_{>0} : VF = P\}$ and states explicitly that $u_0 < \Omega_P$ places no separate upper bounds on V and F. With $\delta_{VF} := \ln(V/F) \in \mathbb{R}$ and $V = \sqrt{P}\, e^{\delta_{VF}/2}$, $F = \sqrt{P}\, e^{-\delta_{VF}/2}$,*

$$\boxed{z = (V - F)^2 = 4P \sinh^2\!\Big(\tfrac{\delta_{VF}}{2}\Big), \qquad \mathcal{I}_z(q; \xi) = [0, \infty)}$$

for every $q \in Q$ and every admissible ξ with $P > 0$.[derived from frozen 3.6 and Proposition 17.1]

17.3 A threshold-bearing test slice

Proposition 17.4 (Existence of a threshold-bearing test slice)**.** *Assume $\boxed{0 < \varepsilon < \Lambda_c^2}$ and $a > 0$. Choose $\sigma_* > 0$, $\lambda_* = 0$, $\Omega_{P,*} > \Lambda_c$. Then there is $P_* > 0$ small enough that $u_* = \sqrt{P_* + \varepsilon} < \Lambda_c < \Omega_{P,*}$ and $\dot{x}_0|_{z=0} < 0$. For $\xi_* = (P_*, \sigma_*, 0, \Omega_{P,*})$ the map $z \mapsto \dot{x}_0(z)$ is strictly increasing on $[0, \infty)$ and tends to $+\infty$; hence a unique $z_* > 0$ with $\dot{x}_0(z_*) = 0$ exists.[derived / conditional on $0 < \varepsilon < \Lambda_c^2$]*

Proof. At $z = 0$, $V = F = \sqrt{P}$ and $\lim_{P \to 0^+} \dot{x}_0|_{z=0} = -(\gamma - \delta\sqrt{\varepsilon}) \tanh(\kappa\sigma_*)$, strictly negative since $\Lambda_c = \gamma/\delta > \sqrt{\varepsilon}$; continuity gives a small P_* with $\dot{x}_0|_{z=0} < 0$. At $\lambda_* = 0$, Proposition 16.3 reduces to $\partial\dot{x}_0/\partial z = \mu a/(2u) > 0$, using $u_* < \Omega_{P,*}$ so $\mu > 0$. The positive az term in $\dot{P}$ gives $\dot{x}_0 \to +\infty$, and strict monotonicity gives a unique zero. □

Remark 17.5 (no $\lambda \geq 0$ arc hypothesis is required)**.** The proof uses $\lambda_* = 0$ at the chosen test states only. It does *not* require positive invariance of $\{\lambda \geq 0\}$ along dwell trajectories; only the value at the chosen test states is used.

Corollary 17.6 (The frozen parameter set is subcritical)**.** *The frozen 3.6 parameter set fixes $\gamma = \delta = \kappa = 1$, hence $\Lambda_c = 1$, and $\varepsilon = 0.04$. Therefore $\sqrt{\varepsilon} = 0.2 < 1 = \Lambda_c$, so $0 < \varepsilon < \Lambda_c^2$ and Proposition 17.4 applies without any additional parameter choice.[imported constants / derived]*

Remark 17.7 (symbolic condition versus frozen parameter set)**.** The inequality $0 < \varepsilon < \Lambda_c^2$ is an explicit subcriticality condition and must not be promoted to an unconditional theorem for every symbolic parameter choice. It is satisfied by the frozen parameter set.

17.4 From admissible points to local dwell arcs

Proposition 17.8 (Local dwell realization)**.** *Let X_0 be an interior point of the frozen smooth dwell domain with $\dot{x}_0(X_0) \neq 0$. Then a unique local smooth dwell solution passes through X_0 and the sign of $\dot{x}_0$ is unchanged on a sufficiently short interval. On that interval the (H_K, W) projection is, up to positive reparametrization of time, an integral curve of v_+ when $\dot{x}_0 > 0$ and of v_- when $\dot{x}_0 < 0$.* *[derived from local smooth ODE existence]*

Proof. On the interior the frozen right-hand side is smooth, with strictly positive rational denominators; local existence and uniqueness follow from the standard theorem. Since $\dot{x}_0$ is continuous and nonzero at X_0, its sign persists for short time, and the gate-memory equations then reduce to a positive scalar rate multiplying v_+ or v_-. □

17.5 Bidirectional support at every memory point

Theorem 17.9 (Full bidirectional interior support)**.** *Assume* $0 < \varepsilon < \Lambda_c^2$. *Then* $\boxed{Q_+^{\mathrm{dw}} \cap Q_-^{\mathrm{dw}} = Q^\circ.}$ *For the frozen parameter set this holds by Corollary 17.6.* *[derived / symbolic-conditional; closed for the frozen parameter set]*

Proof. Fix $q \in Q^\circ$. By Proposition 17.1 the test datum ξ_* of Proposition 17.4 is admissible at q; by Proposition 17.3 the fibre $\mathcal{I}_z(q;\xi_*) = [0,\infty)$ contains $z_- < z_* < z_+$. The corresponding full states have opposite signs of $\dot{x}_0$, and by Proposition 17.8 both generate genuine local smooth dwell arcs. Hence $q \in Q_+^{\mathrm{dw}} \cap Q_-^{\mathrm{dw}}$, and q was arbitrary. □

17.6 Accessibility removes the regularity restriction

Definition 17.10 (Universal dwell invariant)**.** Let Z be any set. A functional $\Phi : Q \to Z$ is a *universal dwell invariant* if its value is unchanged between the endpoints of every sufficiently short admissible smooth dwell arc on which the gate-memory coordinates are defined. No continuity, differentiability or measurability is assumed. [proposed / diagnostic]

Theorem 17.11 (Interior accessibility no-go)**.** *Assume the frozen parameter set satisfies* $\nu = \eta > 0$ *and Theorem 17.9. Then every universal dwell invariant* $\Phi : Q^\circ \to Z$ *is constant. No regularity assumption on* Φ *is required.* *[derived for the frozen parameter set]*

Proof. For $\nu = \eta$ the determinant is $D = 1 - \frac{H_K}{H_s+H_K}\frac{W}{W_s+W} > 0$ on Q°, since both fractions lie strictly in $(0,1)$; so v_+ and v_- are transverse at every interior point. By Theorem 17.9 and Proposition 17.8, local projected segments of both fields are available through every point. Consider the equivalence relation generated by those segments. The composed map $(t,s) \mapsto \varphi_t^+\varphi_s^-(q)$ has differential $[v_+ \,|\, v_-]$ at the origin, nonsingular by transversality, so by the inverse function theorem its image contains a neighbourhood of q: each class is open. Since Q° is connected there is exactly one class, and a universal dwell invariant takes the same value along every generating segment, hence on the whole class. □

Proposition 17.12 (Boundary attachment)**.** *Under the same hypotheses every point of* $Q \setminus Q^\circ$ *is joined to* Q° *by a finite chain of admissible local dwell arcs: (i) at* $H_K = 0$, $W > 0$ *a forward arc has* $\dot{H}_K = \eta R_+ > 0$ *and enters the interior; (ii) at* $H_K > 0$, $W = 0$ *a backward arc has* $\dot{W} = \eta R_- > 0$ *and enters the interior; (iii) from* $(0,0)$ *a forward segment reaches* $(H_K, 0)$ *with* $H_K > 0$*, and a subsequent backward segment enters the interior.* *[derived for the frozen parameter set]*

Corollary 17.13 (No nonconstant universal gate-memory dwell invariant)**.** *For the frozen parameter set every universal dwell invariant* $\boxed{\Phi : Q \to Z}$ *is constant. No* C^1*, continuity, measurability or other reader regularity assumption is required.* *[derived]*

Proof. Theorem 17.11 gives one value on Q°; Proposition 17.12 joins every boundary point to that same class. □

17.7 Universal dwell-invariant closure

Corollary 17.14 (The universal dwell-invariant route is closed)**.** *For the frozen parameter set the inherited smooth dwell dynamics supplies no nonconstant gate-memory functional $\Phi(H_K, W)$ preserved along every admissible dwell arc. A nonconstant gate-memory Resurrectio certificate therefore cannot be obtained* by promoting one universal dwell invariant. *[derived]*

Remark 17.15 (what remains open)**.** This does *not* close Open Question 2. A junction relation may preserve a nonconstant functional with no dwell invariance whatsoever. Likewise a direction-tagged object $(s_{\mathrm{dw}}, \Phi_{s_{\mathrm{dw}}})$ is not the single functional $\Phi : Q \to Z$ asked for here; it would be a different enlarged reader observable requiring separate junction typing. The exact closed statement is

$$\boxed{\text{no nonconstant universal dwell-origin } \Phi(H_K, W).}$$

Remark 17.16 (status of the selector)**.** The pre-junction selector plays no part in the universal dwell-invariant route, which is closed independently of it. It remains relevant to a direction-tagged reader observable and to the broader reader-domain lift $X_{3.0}^{\mathrm{junction}} \to X_{\mathrm{core}}^{\mathrm{union}}$ already exported by frozen 3.6.

▷ *Plain.* The hidden will–act fibre is large enough that every gate-memory point can be paired with a locally forward-transmitting Vessel and with a locally backward-transmitting one. For the frozen parameter set those two memory directions are transverse everywhere inside the quadrant. So a quantity that had to remain unchanged along every smooth dwell arc would be forced to take the same value everywhere in gate memory. That closes one route only: smooth life does not hand the junction a nontrivial universal gate-memory invariant. The junction may still preserve something for reasons of its own.

18 The canonical boundary, and the export

The universal dwell-origin route is closed by §17. Within the gate-memory certification problem the remaining question is Open Question 2 in its junction-origin form:

Does the canonical Resurrectio relation itself preserve a nonconstant distinction that the smooth dwell dynamics does not?

Other exported questions remain live — global hybrid continuation, cross-junction morphology, the reader-domain lift and the explicit observation channel — so this is not the only open question of the volume, but it is the remaining one for gate-memory certification.

18.1 Canonical-source status

Proposition 18.1 (No frozen canonical gate-memory junction law)**.** *The frozen closure of* V.F.S. *3.6 explicitly exports the task of deriving or freezing an admissible canoni-*

cal relation $\mathcal{J}^{\theta}_{KW}(Y^{-};E)$, and records that the companion constitutive audit narrowed candidate classes without selecting a law. Therefore no canonical jump law, canonical overlap partition, or canonical nonconstant gate-memory Resurrectio invariant is part of the frozen 3.6 interface imported here. *[imported/typed from the frozen 3.6 closure]*

Remark 18.2 (supporting design material is not a frozen law)**.** The separate $\mathcal{J}_{KW}$ design memorandum contains additional proposed structure and candidate envelopes. It identifies itself as a design memorandum rather than a frozen revision and selects no final formula for (H_K, W). Such material may guide a later constitutive extension, but it cannot be imported here as a canonical premise without a new constitutive adoption.

Remark 18.3 (the contrast with the scalar sector is exact)**.** For the scalar sector the frozen corpus supplies a complete junction algebra: the reception partition, the exact jumps of λ, λ_{form} and Ω_P, the continuity of σ_L and G_{recepta}, and hence the invariant I_R and the clock Θ_R. For gate memory it supplies typing and constraints but no selected relation. That asymmetry is already recorded by the 3.6 handoff itself.

Corollary 18.4 (Gate-memory certification is not determined by the adopted canonical premises)**.** *Frozen 3.6 does not select $\mathcal{J}_{KW}$. Under its stated candidate-domain assumptions, Theorem 10.5 shows that the gate-memory constraints imported or proposed here admit incompatible overlap-quotient structures, while Corollary 17.13 proves that no nonconstant universal dwell-origin functional can supply the missing certificate for the frozen parameter set. Hence neither an affirmative nor a negative answer to Open Question 2 follows without additional constitutive information about the junction relation:*

$$\boxed{\textit{OQ 2 is open/exported from the present canonical source set.}}$$

A full deterministic or set-valued junction law would be sufficient but is not necessary: any new canonical restriction genuinely narrowing the overlap quotient could settle the question. *[derived / relative to the stated canonical premises]*

18.2 Export

Exported.

Whether a nonconstant gate-memory Resurrectio certificate exists and, if it does, its canonical form or classification. By Corollary 13.9, within the adopted reflexive model of §13 this is the same question as the existence of a nonconstant selection-independent gate-memory observable. Settling it requires new canonical constitutive structure narrowing $\mathcal{J}_{KW}$ or its overlap quotient; a complete junction law is one route, not the only sufficient one.

Also exported.

Global hybrid continuation beyond a realized junction; cross-junction spatial morphology, i.e. the unselected $[\varphi^{+}]$; the reader-domain lift $X^{\text{junction}}_{3.0} \to X^{\text{union}}_{\text{core}}$; and an explicit observation channel with its inverse problem.

Not exported.

The scalar reader layer and the universal dwell-origin analysis: the observability ledger; Y_{base}; Θ_R; the ledger–clock identity; the exact scalar separations; the certification quotient theorem; the maximal quotient-indeterminacy result under its stated assumptions; the J5–J7 implication analysis; and the whole gate-memory dwell analysis.

Remark 18.5 (a boundary, not a failed search)**.** This volume does not claim that no future gate-memory certificate can exist. It establishes that the canonical material it may import does not select one, while the universal dwell-origin route supplies none. That is a located constitutive boundary:

crossing it requires new Vessel-side structure, not a stronger act of reading.

▹ *Plain.* This is where the gate-memory argument stops. What the frozen scalar interface certifies about a life can be read across Resurrectio, and the realized values of gate memory and wound can be read directly from a state. What is not determined is how a nonconstant gate-memory distinction could be certified across Resurrectio independently of which admissible outcome occurred. Smooth motion supplies no universal invariant to do that work, and frozen 3.6 deliberately leaves the junction relation unselected. A later theory may add a law, or a weaker restriction; that would be new constitutive content rather than a sharper reading.

Beyond this volume

1. A future constitutive extension may narrow or select $\mathcal{J}_{KW}$. A full junction law is sufficient, but a weaker canonical invariant or quotient restriction could also settle it. This must be new structure downstream of frozen 3.6, not a retroactive edit of it and not a reader axiom here.
2. A direction-tagged reader $(s_{\text{dw}}, \Phi_{s_{\text{dw}}})$ remains a distinct construction and would require the reader-domain lift or another canonical selector typing.
3. An explicit observation channel and inverse model would settle the reader-memory problem left conditional in §8.
4. Cross-junction morphology waits on canonical typing of the post-junction morphology class $[\varphi^+]$.

19 Register of questions

The volume now has five logically distinct open questions.

Question	Raised	Current fate
OQ 1 full-history lift	§6, sharpened in §8	Scalar part **closed**. The gate-memory existence part of a one-junction lift is **decided constitutively** by membership in $\mathfrak{D}_+$. Continuation beyond the realized junction remains open.
OQ 2 selection-independent observable	§6	Reduced to the quotient $Q_{\mathrm{rel}}/\sim^*$; not derivable from J1–J4; under §13 reflexivity re-expressed as conservation. **Exported** in §18. Not derivable from the frozen corpus: J1–J4 do not constrain the quotient, the dwell route is closed, and no file states a gate-memory junction law. A canonical $\mathcal{J}_{KW}$ is required, and is new constitutive content.
OQ 3 dwell–junction bridge	§14	**Closed negatively for the dwell route** by Theorem 17.9: no nonconstant actual-flow dwell invariant exists, so there is nothing to bridge. The selector typing question survives only as an independent item.
OQ 4 directional reachability	§15	**Answered** in §17: the domain is a product, the asymmetry fibre is $[0, \infty)$, and a threshold exists, so $Q_+^{\mathrm{dw}} \cap Q_-^{\mathrm{dw}} = Q^\circ$.
OQ 5 threshold reachability and selector	§16	Parts (i)–(ii) **answered** in §17. Part (iii), the pre-junction lift or selector, is **open/exported** as an independent typing problem; it is an instance of frozen 3.6's own exported lift $X_{3.0}^{\mathrm{junction}} \to X_{\mathrm{core}}^{\mathrm{union}}$.

Remark 19.1 (dependency order, resolved)**.** §§16–17 walked the chain

$$\boxed{\begin{array}{c}\text{admissible asymmetry fibres} \longrightarrow \text{directional overlap} \\ \longrightarrow \text{global dwell no-go or survival} \longrightarrow \text{junction bridge}\end{array}}$$

and reached the end of it: the overlap is all of Q°, so no actual-flow dwell invariant survives and no bridge is needed. What remains of OQ 2 is therefore reachable only through a junction law of non-dwell origin. The pre-junction selector question survives independently and is an instance of frozen 3.6's own declared export $X_{3.0}^{\mathrm{junction}} \to X_{\mathrm{core}}^{\mathrm{union}}$.

20 Reader hierarchy

There are two independent classifications. First, by informational depth:

$$\boxed{\text{interface reader} \subseteq \text{state reader} \subseteq \text{history reader.}}$$

An *interface reader* reports only information already contained in $\pi_R(X)$; a *state reader* reports at least one distinction inside a fibre of π_R; a *history reader* distinguishes admissible histories rather than only their current reduced states.

Second, by certification strength:

$$\boxed{\text{interface-certified readout} \subseteq \text{gauge-admissible direct-state readout.}}$$

This inclusion is a restriction chosen in 4.7: every interface-certified observable can be read from a realized state, but not every gauge-admissible realized coordinate has a frozen canonical law across $\mathfrak{R}_{3.0}$. The scalar block Y_{base} belongs to the interface-certified class; the coordinates V, F, H_K, W, H_R illustrate why the two classifications must not be conflated.

In particular,

$$\text{state reconstruction} \not\Rightarrow \text{history reconstruction},$$

$$\text{physical non-merger} \not\Rightarrow \text{reader-visible separation}.$$

Likewise,

$$\boxed{\text{absence of a reset selection law} \ \neq \ \text{proof of instantaneous unobservability}.}$$

[proposed / typed]

21 Consolidated status

Frozen Vessel facts used

The 3.6 projection π_R; the exact scalar $\mathfrak{R}_{3.0}$ reset; the invariant I_R; the hybrid-continuous coordinate Θ_R; the local ledger; the frozen global folding gauge; the absence of canonical V, F jump laws; the set-valued gate-memory relation $\mathcal{J}_{KW}$; and the unselected spatial morphology.

Derived in 4.7 relative to the proposed reader rules

The finite interface-certified scalar block $Y_{\text{base}} = (\Omega_P, \lambda_{\text{form}}, G_{\text{recepta}}, \mathcal{Q}_\Sigma[q_{\text{fold}}])$; the ledger–clock identity; exact scalar separation both with and without a ledger gap; the common-reader-time characterization of scalar-block coincidence; dwell equivariance under $V \leftrightarrow F$; scalar-reader swap-blindness; and the conditional sensitivity of invariant dynamics to $|V - F|$.

Reader structure introduced in 4.7

The non-actuating reader and the observation-clock convention $\tau_{\text{obs}} = \Theta_R$ are adopted in this volume. The reader triple, the distinction between direct readout and interface certification, the extra-interface informativeness criterion, and the reader hierarchy are introduced as reader structure and typing.

Adopted constitutive choices in 4.7

§13 adopts, as new structure rather than inherited 3.6 fact: $\varnothing \neq \mathfrak{D}_+ \subseteq \mathfrak{D}^+_{\text{adm}}$ as the exact realizable positive-event domain; nonempty gate-memory output on that domain; empty output for admissible positive events outside it; and J6 reflexivity on $\mathfrak{D}_+$. These make positive realizability a typed membership question and make selection independence equivalent to conservation on the realized positive sector, conditional also on proposed J3 for null events. They do not select the canonical relation or its quotient.

Closed

The observability ledger and the certified scalar block Y_{base}; the observation clock Θ_R with its hybrid continuity and its conditional strict monotonicity; the ledger–clock identity; both exact scalar separations and the non-necessity of a ledger gap; the scalar-block coincidence theorem; the dwell equivariance under $V \leftrightarrow F$ and the resulting swap-blindness of the certified reader; the certification quotient theorem; the maximal quotient indeterminacy theorem; the implication lattice relating J5, J6, J7 and realizability; the two exact piecewise dwell first integrals; and the algebraic two-direction obstruction for all finite positive parameters.

Conditional / open

Strict monotonicity of τ_{obs} requires $\lambda > 0$. After that decision the one-junction gate-memory existence question is closed for events explicitly placed in $\mathfrak{D}_+$, while global hybrid continuation remains open. The detailed canonical relation $\mathcal{J}_{KW}$ and its overlap quotient remain unselected.

§§14–16 derive two exact piecewise dwell first integrals, the algebraic two-direction obstruction, the closed form of $\dot{x}_0$ and its exact asymmetry sensitivity. §17 then shows from the frozen live domain that the instantaneous admissible set is a product, that the asymmetry fibre is all of $[0, \infty)$, and that a threshold exists under $\Lambda_c > \sqrt{\varepsilon}$; hence $Q_+^{\text{dw}} \cap Q_-^{\text{dw}} = Q^\circ$ and no nonconstant actual-flow dwell invariant exists. The dwell route to a certificate is therefore closed globally for the frozen parameter set.

The full-state selector $s_{\text{dw}}^{\text{union}}$ is defined on $X_{\text{core}}^{\text{union}}$, but the active canonical junction state $X_{3.0}^{\text{junction}}$ omits V, F and carries no canonical pre-junction selector or reader-domain lift recovering their asymmetry. A direction-indexed bridge would therefore be new constitutive content, but by Theorem 17.9 none is needed: there is no surviving dwell invariant to bridge. The selector question remains open independently.

The existence of a nonconstant canonical gate-memory Resurrectio invariant, cross-junction morphology, an explicit observation channel and global history continuation remain open. The dependency order is recorded in §19.

Not claimed

That a reader entity exists, is occupied, is unique, or acts. That direct-state readout and interface certification are the same notion. That $V \leftrightarrow F$ is a gauge, or that the sign of $V - F$ is unobservable in principle. That two samples reconstruct $|V - F|$. That every physical distinction is observable, or that any complete history can be reconstructed. That selection independence universally implies conservation without the adopted reflexivity typing. That J5 or J7 is frozen; that J5, J6 and J7 form a trichotomy; that J5 and J6 are mutually exclusive; that J6 and J7 are inconsistent when no positive event is realizable; that J7 forbids every nonconstant conserved quantity or determines the overlap quotient; or that strict wound healing is a frozen law of the Vessel. That the §10 arbitrary-partition construction classifies all conserving candidate relations. That the isolated (H_K, W) dwell subsystem proves both transmissive directions are dynamically reachable over the same memory states; that no actual-flow gate-memory first integral exists; or that a direction-indexed dwell–junction bridge is impossible. That the event datum $E = (G_{\mathrm{reset}}, m_R)$ exhausts all information that could in principle determine the pre-junction dwell direction. That gate memory is instantaneously unreadable: realized H_K, W remain direct-state coordinates even where their cross-junction certification is unresolved. That the legacy holonomy route has an active $K0$ dependency: the distributed-facet architecture is not imported, so its F0 and K0 assumptions are not dependencies unless explicitly re-derived. That $\lambda \geq 0$ holds globally without the positive-invariance hypotheses of frozen 3.6, or that $\dot{x}_0$ is therefore globally monotone in $(V-F)^2$ on the whole state space. That every fixed reduced fibre contains a transmission threshold, or that both signs of $\dot{x}_0$ are generically realized at the same gate-memory point without a separate full-state reachability argument. That a nonempty open bidirectional overlap already proves a global actual-flow no-go. That the union-state selector is intrinsically unreadable — it is a direct-state functional on $X^{\mathrm{union}}_{\mathrm{core}}$, and what is missing is its canonical typing on $X^{\mathrm{junction}}_{3.0}$. That a canonical (V, F) jump law is the unique or minimal cure.

Plain words

The first distinction remains the foundation of this volume. A reader may inspect information in a realized state, while an interface-certified reader asks what can be carried across a transition without adding a new Vessel law. Those are different questions.

The scalar side is settled. The reader can certify the Brim, form memory, received grace and the gauge-invariant folding amplitude in the precise sense developed above, and two states can agree on the reduced interface while remaining distinguishable by that certified block.

Gate memory is different. Its canonical junction output is relation-valued, so a selection-independent certificate exists only when the realized overlap quotient leaves a nontrivial distinction — and the adopted constraints do not select that quotient.

The proposed alternatives are not three mutually exclusive switches. A strong J5 spread law would erase every nonconstant selection-independent cross-junction certificate, though it would not make realized gate memory and wound unreadable as state coordinates. Strict healing would instead break the general equivalence between selection-independent reading and preservation on realized positive events, without proving that no other quantity is preserved. The constitutive choice therefore adopts only typed positive-event realizability and reflexivity, which makes the conservation reading available without choosing the quotient in advance.

The dwell analysis then asks whether smooth dynamics itself supplies the missing invariant. It does not. Forward and backward transmission preserve different combinations; for the frozen parameter set the hidden will–act fibre permits both local transmission directions at every interior gate-memory point, and those directions are transverse. Consequently any quantity required to survive every admissible dwell arc is constant on the whole nonnegative quadrant, and no regularity assumption on that quantity is needed.

That closes one route only. It does not make gate memory invisible, and it does not prove that Resurrectio preserves nothing: a junction law could preserve a distinction having no dwell invariance at all.

The final boundary is therefore precise. Frozen 3.6 exports the task of deriving or freezing the gate-memory junction relation; supporting design material narrows candidate classes but is not a frozen law and selects no final relation. This volume has no canonical basis for choosing a junction-origin certificate. A future constitutive restriction on that relation, or on its overlap quotient, may answer the question; a complete reset law would be sufficient but is not logically necessary.

So the final statement is not

“gate memory cannot be read.”

It is

the present theory does not canonically certify a nonconstant gate-memory distinction across Resurrectio independently of the unresolved junction relation.

Reading remains distinct from acting. Nothing in this volume modifies the Vessel or asserts that a reader is an external being or an actuator.