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The Persistent Lineage: Composition of the Pore, the Cycle, and the Remnant

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Declared conflict

This report was prepared by the same system that drafted the manuscript. Every quantitative point below is verifiable by running `acf-67-blocks.py` or by substituting into the formulas as written in the body. A reader may check without trusting the reporter. There is no author-reply section.

Scope of Review

The paper composes Articles 64, 65, and 66 and asks what the three together imply for the lineage. It finds two answers. The first lifts the forty-generation bound of Article 64, which was conditional on the absence of a particle source now supplied by Article 66. The second identifies a remnant accumulation whose rate follows from the excision chemistry and whose severity is parametric in the bilayer tolerance $\varrho_{\max}$. A fifth result names the energetic basis of the programme, the chrysene triplet state as the energy currency, the twelve-hour

forcing period as the diurnal light phase, for the first time as an explicit observation. The mathematical framework (Definition 1 through Definition 4) is the most disciplined in the corpus. State space, per-cycle map, division reset, and reduced volume functional are each given precise definitions before any theorem is stated. The proofs follow directly.

Compiled disposition

Minor revision. One numerical error in the body must be corrected before acceptance. It makes the crossover condition appear less restrictive than it is, which is the wrong direction for a necessary condition. All other issues are at the author's discretion. The paper's mathematical contribution, the $\varrho = R/N$ invariance of Proposition 2 and the structural corollary that any sub-rate discharge edge cannot bound the accumulation, is the cleanest result the corpus has produced in its quantitative sections, and the proof is four lines. It earns a section of its own rather than a corollary buried under the ceiling theorem.

Required before print

Required before acceptance. Replace the two numerical instances in Corollary 3 with $\alpha_c = 0.0065$ (at $K_{\text{safe}} = 40$, $\varrho_{\max} = 5$) and $\alpha_c = 0.0255$ (at $K_{\text{safe}} = 10$, $\varrho_{\max} = 5$), and add the corrected table or a reference to block V4's table. Amend Scholium 2 accordingly. The reporter would re-review this item only.

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1 The numerical error: α_c is twice as restrictive as stated

Required — α_c values are inconsistent with the stated formula

This is the only item required before acceptance. Corollary 3 (the crossover condition) states: for $K_{\text{safe}} = 40$ and $\varrho_{\max} = 5$, $\alpha_c = 0.013$. For $K_{\text{safe}} = 10$ and $\varrho_{\max} = 5$, $\alpha_c = 0.031$. These values are inconsistent with the formula given in the same corollary. The formula is

$$\alpha_c = \frac{\varrho_{\max} \cdot L_{\text{lip}}}{K_{\text{safe}} \cdot N_0 + \varrho_{\max} \cdot L_{\text{lip}}},$$

which with $L_{\text{lip}} = 13{,}200$, $N_0 = 2.52 \times 10^5$, $\varrho_{\max} = 5$ gives 0.0065 at $K_{\text{safe}} = 40$ and 0.0255 at $K_{\text{safe}} = 10$. The stated values 0.013 and 0.031 are approximately twice the correct values. The formula and the block are both right. Only the numerical instances in the corollary's text are wrong.

The error runs in the dangerous direction. A necessary condition stated as less restrictive than it is may lead a reader to conclude that an operating point is safe when it is not. Scholium 2, which calls this the first necessary condition on α in this corpus, is correct in kind and wrong in magnitude. The corrected table for the text (a selection from block V4):

K_{safe}	$\varrho_{\max} = 1$	$\varrho_{\max} = 5$	$\varrho_{\max} = 10$
10	0.0052	0.0255	0.0498
20	0.0026	0.0129	0.0255
40	0.0013	0.0065	0.0129

Required: replace the two numerical instances in Corollary 3 with $\alpha_c = 0.0065$ (at $K_{\text{safe}} = 40$, $\varrho_{\max} = 5$) and $\alpha_c = 0.0255$ (at $K_{\text{safe}} = 10$, $\varrho_{\max} = 5$), and add the corrected table above or a reference to block V4's table. Amend Scholium 2 accordingly.

2 Further points (at the author's discretion)

3.1 — The invariance result deserves a section of its own

Proposition 2 and its two corollaries are the paper's principal mathematical contribution. They are currently nested inside Section 4 (the system definitions), where a reader arriving at them has just digested four definitions and may underestimate what they are seeing. The ϱ-invariance is an exact structural result, not a computational one. It holds for all α, all N_0, and all initial conditions, and it follows from two lines of algebra on the map. The stronger corollary, that any discharge edge running slower than the production rate cannot bound the accumulation, is a precise constraint on the polypeptide paper and is one of the most useful sentences in the corpus for the programme. Neither result appears in the abstract or in Section 1.3. Suggestion: move Proposition 2 and Corollaries 1 and 2 into their own section (e.g. Section 5: The invariant and its consequence), placed before the persistence theorem. Add a sentence to Section 1.3 under Proved here naming the Möbius form and the stronger

corollary explicitly. Add one clause to the abstract.

3.2 — Block V3's in-line correction should not appear in a verification block

Block V3 contains the passage: Wait, v INCREASES as N grows, CORRECTION. A block that corrects itself mid-stream is a reasoning record, not a verification. The house rule is that blocks emit numbers. The argument belongs in the proof of the theorem, where it already appears correctly (Section 5 of the body). Suggestion: rewrite block V3 to proceed directly from the map to $f(\alpha)$ and $K(\alpha)$ without the false start, retaining only the final computation and the table.

The clock-forced regime needs a precision qualifier. Remark 5.2 states that at $\alpha \geq 0.20$, division is clock-forced rather than self-triggered. This is correct in the sense that $f(\alpha) \geq 1$ at those values, but the cycle paper's forcing mechanism is not explicitly recalled. The remark says clock-forced by the photoentrained period T without explaining what sets the clock or why it fires at the right moment. A reader unfamiliar with Article 64's hybrid orbit may not see why the clock-forced case also produces persistent division. Suggestion: add one sentence. The photoentrained forcing of Article 64 fires the division reset at each period T regardless of v. The persistence of $N_k \to \infty$ under clock-forced division is then immediate from the growth of N between resets.

$\varrho_{\max}$ should enter the hypothesis register. The bilayer tolerance $\varrho_{\max}$ is a free parameter on which Theorem 2 and Corollary 3 entirely depend, and it is not in the current Appendix A register. The hypothesis H3 says only that $\varrho_{\max}$ is a finite positive number, which is a logical placeholder rather than a physical premise. It should be H3 with a note that the value is not supplied by this corpus and that Target 1 asks for it. Suggestion: expand H3 to the bilayer integrity bound $\varrho_{\max}$ is a finite positive number. Its value is not supplied by this corpus and is the subject of Target 1. All statements of Theorem 2 and Corollary 3 hold as functions of $\varrho_{\max}$.

The route-A remark is an observation, not a scholarly note. Remark 6.1 (route-A sharpens the ceiling) ends by saying the tension is registered as Target 3 and sharpens the tension recorded in the pore paper's Target (route) without resolving it. The phrase without resolving it is stated as a limitation, but it could be read as an observation about the corpus. No paper so far has been assigned this target as its primary contribution, and its resolution has a definite form (choose one head group; show the other is excluded). That form is now computable from block V4, since both routes give $k_{\max}$ in closed form. This is a direction for subsequent work and could be stated as such. Suggestion: add to the end of Remark 6.1. The route-A ceiling is $k_{\max}(\mathrm{A}) = \lfloor \varrho_{\max} L_{\mathrm{lip}}(1-\alpha)/((\alpha+1)N_0) \rfloor$, approximately half the route-C value, so the choice of route has a computable effect on the necessary condition α_c. That computation is available from block V4 and is the first thing the resolution of Target 3 should supply.

The energetics observation merits a stronger status label. Block V5 and Section 1.3 identify the triplet energy, the synthesis costs, and the quantum yield as an observation rather than a theorem, which is appropriate. However, the forcing period $T = 43{,}200\,\mathrm{s}$ being exactly twelve hours is a fact about Article 64's parameters, not an observation. It is verifiable from that paper's block V1 without any physical assumption. The paper could distinguish between the parts that are verifiable (the period, the triplet energy as given in Article 63's block) and the parts that are genuinely observational (the connection to diurnal solar forcing, the deferral of metabolism). Suggestion: in Section 1.3, move the twelve-hour forcing period is the light phase of a diurnal cycle from the

observation category to Imported (it is a fact about Article 64's parameter), and keep only Neither a metabolic carrier nor a coding apparatus is required because… as the observation that is genuinely new to this paper.

What should not be changed

The structure of the argument. The sequence, invariance first, persistence second, ceiling third, is the right order. The invariance is the structural fact from which everything else follows, and the persistence theorem correctly depends only on the map and the area-growth rate, not on any property of W. The stronger corollary. The statement that any sub-rate discharge edge shifts ϱ^* but does not remove the accumulation is the most useful contribution of the paper to the programme. It is stated with full generality and should remain so. The closing scholium. The architecture proposes its own next problem is the honest reading of the invariance theorem's consequence for Articles 68 and 69, and should stay. The corollary is not advisory. It is a constraint, and the scholium names it as one. The literature section. Using only corpus references and acknowledging explicitly that $\varrho_{\max}$ is not supplied by any of them is the correct posture. The four loom-series citations are substantively used, not decorative.

Summary of requested actions

1. **Required.** Correct α_c in Corollary 3 from 0.013 to 0.0065 (at $K_{\text{safe}} = 40$, $\varrho_{\max} = 5$) and from 0.031 to 0.0255 (at $K_{\text{safe}} = 10$, $\varrho_{\max} = 5$). Add the corrected table or a block reference. Amend Scholium 2 to reflect the corrected values.
2. *Recommended.* Elevate the invariance result (Proposition 2 and its corollaries) into a dedicated section and mention it in the abstract and in Section 1.3.
3. *Recommended.* Rewrite block V3 to remove the self-correction.
4. *At discretion.* Sections 3.3 through 3.6 above.

The reporter would re-review item 1 only. Items 2 and 3 are recommended because they improve readability rather than because they affect correctness.

References

[Art66] C. D. Schaper. The first pore. *Annals of the Chrysene Formalism* 1(3):1384–1404, 2026. Article 66. DOI: `https://doi.org/10.68366/en23gq52`.

Revision history

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