

Erasure as a Condition of Reality

Abstract

This paper presents an axiomatic account of erasure as a lawful condition of reality.

Building on the Law of Continuity

Reality = Occurrence + Continuity

the paper isolates continuity as a structural condition of intelligibility and decomposes it into three irreducible components: persistence, difference, and reference. The central contribution is a core axiom and theorem of erasure:

Persistence + Difference without Reference = Erasure.

Under this condition, operation continues while worldhood fails. The claim is ontological rather than epistemic; it concerns reality itself, not representation, perception, or opinion. The paper establishes scale invariance across persons, systems, worlds, and universes, introduces a structural engineering model (the Balloon Mechanism) to render the axiom operationally intelligible, and proves the performative inescapability of reference. The result is a formal framework for diagnosing erasure without collapse, error, or deletion.

1. Introduction

Philosophical and scientific accounts of reality have long distinguished between what happens and what holds. Events, processes, and changes may occur without thereby constituting a world in which outcomes belong, responsibility binds, and history accumulates. This distinction is implicit in Aristotle's claim that being is not exhausted by change (*kinesis*) but requires an account of what remains the same through change (*Metaphysics*, Γ; Δ). It is likewise implicit in Kant's insistence that succession alone does not yield objective experience without rules that bind appearances together (*Critique of Pure Reason*, A176–A189).

Contemporary systems intensify this distinction. They increasingly preserve successful operation in execution, throughput, prediction while dissolving attribution, repair, and belonging. This paper argues that such cases are not pathological but lawful. They instantiate a structural condition in which occurrence is preserved while continuity fails. To make this intelligible, continuity must be isolated and formalised as a condition of reality itself rather than treated as an implicit background assumption.

2. The Law of Continuity

The Law of Continuity states:

Reality = Occurrence + Continuity

Occurrence names what happens: events, actions, changes, and processes.

Occurrence is sufficient for sequence and execution. It is insufficient for belonging,

inheritance, or history. This distinction aligns with Hannah Arendt's analysis of the difference between mere activity and a *world* that can hold appearances together through durability and accountability, rather than dissolving them into fleeting succession (Arendt 1958).

Continuity is the invariant structural condition under which what occurs remains intelligible as belonging to a bearer across time, change, interruption, or absence. The move mirrors the invariance strategy of modern physics, where lawful identity is preserved across permissible transformations rather than reduced to particular frames of observation (Einstein 1916). Continuity is therefore not an empirical add-on to reality but a boundary condition of intelligibility.

3. Decomposition of Continuity

Continuity holds only where three irreducible components operate together in a fixed order:

1. Persistence is the condition under which what occurs can remain across time, interruption, or absence.
2. Difference is the condition under which what persists can be this rather than that.
3. Reference is the condition under which what persists as differentiated can belong to a bearer.

Formally:

Continuity $\Leftrightarrow$ Persistence $\wedge$ Difference $\wedge$ Reference

Each component is necessary; none is sufficient alone. This decomposition is structurally consonant with Kant's claim that objective temporal experience presupposes conditions that unify succession under rules rather than leaving it as a mere flow of impressions (Kant 1781/1998, A176–A189). Persistence without difference yields undifferentiated duration; difference without persistence yields noise. Reference presupposes both, since attribution requires something that endures and is already individuated.

4. Core Axiom of Erasure

Core Axiom: Erasure

Persistence + Difference without Reference = Erasure

Operation continues. Worldhood fails.

This axiom concerns reality itself, not representation, perception, or opinion.

Erasure names a structural condition, not a moral judgement and not a system error. Under erasure, events remain real and causally effective while losing the capacity to bind responsibility, repair, and belonging. This condition echoes Arendt's warning that responsibility and worldliness can disappear without physical destruction, leaving only functional processes and administration in their wake (Arendt 1958).

5. Worldhood Failure under Reference Withdrawal

Theorem. If persistence and difference obtain while reference is withdrawn, erasure necessarily occurs.

Formal: $(\text{Persistence} \wedge \text{Difference} \wedge \neg \text{Reference}) \Rightarrow \text{Erasure}$

Proof sketch. Persistence alone preserves duration but not individuation. Difference alone individuates but does not bind. Reference attributes but presupposes the former two. Removing reference while retaining persistence and difference preserves operation without attribution. Hence events continue without belonging and worldhood fails. ■

6. Engineering Interpretation: The Balloon Mechanism

Worldhood may be modelled as lift. Continuity supplies lift; occurrence supplies motion. A bearer supplies reference and absorbs load. Representational systems attach as auxiliary structures that borrow continuity. When reference returns, systems remain auxiliary. When continuity is extracted faster than reference is regenerated, auxiliary structures invert into load. Nothing need break for erasure to occur.

7. Scale Invariance

The Law of Continuity and the Core Axiom of Erasure are scale invariant. They apply wherever what occurs must remain answerable as belonging. This includes persons, institutions, technical systems, worlds, and universes. The criterion is not life, consciousness, or social recognition, but worldhood.

At the level of personal identity, the persistence question has long been treated as a genuine metaphysical problem rather than a linguistic convenience (Parfit 1984). At the level of physical theory, the preservation of invariant structure across transformations is a condition of intelligibility for any account of a single universe rather than disconnected

frames (Einstein 1916). At the level of social reality, Arendt emphasises that a common world can disappear without physical destruction, leaving only processes and administration (Arendt 1958).

These are not separate problems. They are scale variants of the same structural demand: that what occurs remain referable as belonging rather than dissolving into mere sequence.

8. Performative Inescapability of Reference

Any attempt to deny the necessity of reference commits a performative contradiction. To assert that reference is dispensable or merely representational already presupposes attribution to a speaker, persistence of the claim as the same claim, and its distinction from other claims. Reference is therefore enacted by the act of denial itself.

This structure is articulated explicitly in transcendental philosophy. Kant shows that the conditions of objective judgement cannot themselves be denied without incoherence, because denial already relies on those conditions (Kant 1781/1998). Apel formalises this insight as performative self-contradiction: denying a condition that one must already presuppose in order to deny it confirms that condition rather than refuting it (Apel 1998). Habermas extends this analysis by showing that communicative acts presuppose accountability and answerability even when contested (Habermas 1984).

The Law of Continuity and the Core Axiom of Erasure are therefore not optional theses but inescapable conditions of intelligibility.

9. Evidentiary Grounding

The claim that erasure is a lawful condition of reality rather than an absence, failure, or deletion is supported by convergent arguments across ontology, philosophy of science, and social ontology. Aristotle distinguishes between change and what remains through change, arguing that being cannot be reduced to motion alone, since motion presupposes a subject that persists as the bearer of change (*Metaphysics*, Γ, Δ).

Persistence is therefore a precondition of intelligibility rather than a contingent feature of entities.

Kant sharpens this requirement by showing that succession alone does not yield objective experience. Without rules that bind appearances together across time, experience collapses into a mere sequence without objectivity (*Critique of Pure Reason*, A176–A189). This supports the claim that persistence and difference are insufficient for worldhood unless attribution is preserved.

Modern physics formalises the same structural demand through invariance. Einstein's theory of relativity preserves lawful identity across transformations rather than dissolving reality into disconnected frames. Invariance is not an empirical addition but a condition for describing a single universe rather than unrelated perspectives (*Relativity*, 1916).

This supports the treatment of continuity as a boundary condition of intelligibility.

In social ontology, Arendt explicitly identifies the possibility of world loss without physical destruction. A common world can disappear while processes, administration, and

activity continue, leaving order without durability or responsibility (*The Human Condition*, 1958). This directly supports the claim that operation can continue while worldhood fails.

Finally, the not optional status of reference is established through the literature on performative contradiction. Kant shows that the denial of the conditions of judgement presupposes those same conditions. Apel formalises this insight as performative self contradiction, demonstrating that reference, attribution, and accountability are enacted even in acts of denial (*A Theory of Communicative Action*, 1998). Habermas extends this argument by showing that communicative acts presuppose answerability even when contested (*The Theory of Communicative Action*, 1984).

Taken together, these sources support the conclusion that erasure is not an accidental breakdown or normative failure, but a lawful structural possibility wherever persistence and difference remain while reference is withdrawn.

10. Conclusion

Erasure is not the absence of reality but a lawful condition of reality under reference withdrawal. When reference is withdrawn while persistence and difference remain, nothing disappears and nothing breaks. Events continue to occur, processes remain causally effective, and systems continue to operate. What fails is not reality itself, but worldhood: the structural capacity for what occurs to belong, to bind responsibility, to accumulate as history, and to remain answerable to a bearer. The possibility of world loss without physical destruction has been identified explicitly by Arendt, who shows

that a common world can disappear while activity and administration continue unabated (Arendt 1958).

By formalising continuity axiomatically, this paper has shown why operation alone is insufficient for worldhood. Continuity is not an added feature or secondary effect but a structural condition composed of persistence, difference, and reference, operating in a fixed and necessary order. Kant demonstrates that succession alone does not yield objective experience unless appearances are bound together by conditions that make attribution and identity possible across time (Kant 1781/1998, A176–A189). Where persistence and difference are preserved without reference, operation can continue without contradiction, yet attribution collapses. Outcomes persist without authors, effects persist without bearers, and repair becomes structurally unavailable. Erasure therefore presents not as malfunction, bias, or deletion, but as order without worldhood.

The framework developed here provides a diagnostic that does not rely on evaluative judgement, interpretive disagreement, or domain specific failure. It explains how erasure can arise precisely under conditions of technical success, administrative efficiency, and systemic stability. The same structural logic appears in modern physics, where the preservation of invariant relations is required for describing a single universe rather than disconnected frames of observation (Einstein 1916). Continuity therefore functions as a boundary condition of intelligibility rather than as an empirical property.

Because the Law of Continuity is scale invariant, this diagnosis applies wherever what occurs must remain intelligible as belonging. This includes persons, institutions, technical systems, worlds, and universes. The persistence problem in personal identity

has long been treated as a genuine metaphysical issue rather than a linguistic convenience (Parfit 1984), while the necessity of reference and attribution is reinforced by the argument that denying such conditions already presupposes them in the act of denial itself (Apel 1998; Habermas 1984).

Erasure is therefore neither exceptional nor contingent. It is a structural possibility inherent in reality itself whenever reference is withdrawn while persistence and difference remain. Recognising this condition clarifies why preventing breakdown is not sufficient to preserve worldhood. What must be preserved instead are the conditions under which reality can continue not only to operate, but to hold together as a world.

References

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