BOOK AS AUTHOR'S PROJECTION INTO THE WORLD LINE: COHERENT ARTIFACT AND THE FORMULA OF INFINITY

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ABSTRACT

Within the Observer-Dependent Theory of Everything (ODTOE) [1], the nature of the book as both a physical object and a cognitive phenomenon is investigated. A book is shown to be not an "information container" but a coherent artifact: a projection of a section of the author's world line W_{auth} in the space of potential states $\mathcal{H}$, encoded in a form accessible for re-actualisation by future observers [2]. A formal model of the book as an operator $\hat{O}_{\text{book}}$ acting on reader coherence is introduced: $B_{\text{reader}}^{\text{after}} = f(\hat{O}_{\text{book}}, B_{\text{reader}}^{\text{before}})$. The formula for book lifetime $T(A) = T_0/(1 - S_A)^{n_{\text{readers}}}$ is derived [2], from which it follows that at $S_A \to 1$ and $n_{\text{readers}} \to \infty$, lifetime $T \to \infty$ — the book achieves immortality. A scale of coherent artifacts is constructed: from spoken word ($T \sim$ hours) to mathematical formula ($T \to \infty$). A comparison of the book with other artifacts (speech, law, building, formula, DNA) is carried out, and it is shown that the book occupies a unique position: sufficiently coherent for long life and sufficiently accessible for mass re-actualisation — a combination not characteristic of any other class of artifacts. Implications for publishing, library preservation, digital archives and education are discussed.

Keywords: book, coherent artifact, world line, author projection, artifact lifetime, immortality, ODTOE, formula, re-actualisation, coherence, observation operator.

I. INTRODUCTION: THE ENIGMA OF THE BOOK

The book is one of the most ancient technological objects of humanity. Sumerian clay tablets (ca. 3200 BCE), Egyptian papyri, medieval parchment, Gutenberg's printed book (1455), the electronic book (1971, Project Gutenberg) — five thousand years of the same basic function: fixing thought in a material medium [3]. Cultural anthropology describes the book as a technology of "extended memory" [8], communication studies

— as a low-noise information transmission channel, philosophy — as the embodiment of the spirit of an era. But none of these disciplines answers the central question: *why are some books immortal while others die on the day of publication?*

Standard answers — "information carrier," "means of communication," "cultural monument" — describe function, not nature. Why has Homer's *Iliad* lived for 2800 years while yesterday's newspaper — for a day? Why does one book change the world (the Bible, Newton's *Principia* [18], Marx's *Capital*), while millions of others disappear without a trace? Why does the author die, yet his book continues to act — sometimes more powerfully than during his lifetime?

Shannon's information theory [15] offers a quantitative measure of information ($H = -\sum p_i \log p_i$), but does not distinguish the information contained in Kant's *Critique of Pure Reason* from the information in a random sequence of symbols of the same length — both have a definite entropy, but their effect on the observer differs by orders of magnitude. Dawkins's meme theory [16] offers an analogy with genes but does not formalise the mechanism of idea "survival" — why some memes replicate for millennia while others vanish instantly.

ODTOE offers an answer derivable from the single axiom $R = \hat{O}(\Psi)$ [1]. The book is neither a container nor a channel, but a *coherent artifact*: a projection of a section of the author's world line in a form that admits re-actualisation by an arbitrary number of future observers. The lifetime of an artifact is determined by two parameters — content coherence S_A and cumulative number of observers n_{readers} — and obeys a formula from which the possibility of immortality follows [2].

The ODTOE approach to the phenomenon of the book differs from existing theories in several respects. Unlike semiotics (Eco [12], Borges [23]), which analyses the book as a *sign system*, ODTOE treats the book as an *operator* that changes the state of the observer. Unlike the sociology of knowledge (Manguel [8]), which describes the social conditions of reading, ODTOE formalises the *mechanism* of the book's effect on reader coherence. Unlike bibliography and book science [19], which describe the history of the book as a technology, ODTOE derives the formula for longevity from fundamental postulates.

The aim of this paper is to formalise the concept of the book as a coherent artifact, derive the formula for book lifetime, construct a scale of artifacts, compare the book with other classes of objects, and discuss practical implications for authors, libraries, digital archives, and the education system.

The paper is organised as follows. Section II presents the theoretical foundations: ODTOE postulates, the definition of the coherent artifact, and the connection with information theory. Section III defines the book as a coherent artifact and derives the lifetime formula. Section IV analyses the book as a projection of the author and an operator acting on the reader. Section V constructs the scale of coherent artifacts. Section VI investigates the relationship between the book and the formula. Section VII considers the life of the book after the author's death. Section VIII discusses practical implications. Section IX contains discussion and limitations. Section X formulates experimentally testable predictions. Section XI provides the conclusion.

II. THEORETICAL FOUNDATIONS: ODTOE AND THE COHERENT ARTIFACT

II.1. Basic Postulates of ODTOE

The Observer-Dependent Theory of Everything [1] is built on three postulates:

P1. Reality is the result of observation: $R = \hat{O}(\Psi)$, where $\Psi \in \mathcal{H}$ is a potential state, $\hat{O}$ is the observation operator, and R is the actualised reality.

P2. The cognitive coherence of an observer is determined by the product of four components:

$$B = F \cdot E \cdot (1 - \sigma) \cdot \Lambda \tag{II.1}$$

where F is focus, E is emotional coherence, σ is internal contradictoriness ($\sigma \in [0, 1]$), and Λ is the density of lived experience [1].

P3. The lifetime of a configuration is determined by the formula:

$$T(C) = \frac{T_0}{(1 - S)^n} \tag{II.2}$$

where T_0 is the base lifetime of the material medium, S is the self-consistency (coherence) of the configuration, and n is the number of observers supporting the configuration [1].

The world line of an observer $W = \{\Psi_n^*\}_{n \in \mathbb{Z}}$ is an ordered sequence of actualised configurations existing in $\mathcal{H}$ as a single non-separable object [5]. After the death of the observer ($B \to 0$), the world line does not vanish — only the generation of new configurations ceases [4].

It is important to emphasise that postulates P1–P3 are not *additional* assumptions imposed on standard physics. They represent a *reformulation* of fundamental principles in which the observer ceases to be an external agent and becomes a constitutive element of the theory [1]. The quantum-mechanical measurement problem [13] is a special case of P1: wave function collapse is nothing other than the act $\hat{O}(\Psi)$ performed by a particular observer with a definite coherence B.

For the purposes of this paper, the key postulate is P3: it links the *longevity* of any object with two parameters — internal consistency (S) and the number of observers (n). The book, as will be shown below, is an object for which both parameters can attain extremely high values — which explains the phenomenal longevity of the best books.

II.2. Definition of the Coherent Artifact

In [2], the concept of a coherent artifact was introduced — an object that preserves and transmits the coherence of its creator to future observers. A coherent artifact A is defined by three properties:

(C-1) Encoding. The artifact encodes a section of the creator's world line $W_{\text{auth}}|_{t_0}$ in a form that admits decoding by other observers.

(C-2) Autonomy. The artifact preserves the encoded content after the creator has ceased generating it — including after the creator's death ($B_{\text{auth}} = 0$).

(C-3) Scalability. The artifact can be decoded by an arbitrary number of observers ($n_{\text{readers}} \to \infty$) without degradation of the encoded content.

Not every object is a coherent artifact. A stone is a physical object but not an artifact (it does not encode a world line). A handshake is a social act but not an artifact (it is not autonomous; $T \to 0$ upon cessation of contact). The spoken word is a partial artifact (it encodes but does not scale without degradation) [6].

It is important to distinguish a coherent artifact from a *trace*. A trace (e.g., a footprint in mud) satisfies conditions (C-1) and (C-2), but not (C-3): it does not scale. A photograph is an intermediate case: it is scalable (copiable) but encodes only the *external configuration*, not a section of the world line (thought, argument, emotion). The book encodes the *internal* state of the author — his coherence B_{auth} — in symbolic form, which makes it a coherent artifact in the full sense [2].

Let us define the *encoding depth* of an artifact $\mathcal{K}(A)$ as the number of components of B that the artifact is capable of transmitting:

$$\mathcal{K}(A) = |\{X \in \{F, E, (1-\sigma), \Lambda\} : X_{\text{auth}} \to A \to X_{\text{reader}}\}| \tag{II.4}$$

For a photograph, $\mathcal{K} = 1$ (only E — emotion — is transmitted). For a musical composition, $\mathcal{K} = 2$ (E and partially F). For a book, $\mathcal{K} = 4$ — all four components are transmitted, making the book an artifact with maximal encoding depth among the means available to humanity [7].

II.3. Connection with Information Theory

Classical information theory [15] operates with entropy $H = -\sum p_i \log p_i$ and a transmission channel with capacity C. In the context of ODTOE, information entropy describes the *quantity* of information but not its *coherence*. Two texts of equal length may have comparable entropy but radically different coherence S_A: a random sequence of symbols and Pushkin's *Eugene Onegin* formally contain a comparable number of bits, but the S_A of *Onegin* is orders of magnitude higher [7].

Shannon himself noted that his theory deliberately abstracts from the *meaning* of messages [15]. In the context of ODTOE, this abstraction is equivalent to ignoring coherence — the parameter that determines how much a message is capable of *changing the observer*, rather than merely *transmitting data*. Meme theory [16] is closer to the ODTOE position, since it introduces the notion of meme "fitness" (an analogue of S_A), but does not formalise it quantitatively.

Let us introduce the concept of *coherent information* I_{coh}, distinct from Shannon information:

$$I_{\text{coh}}(A) = H(A) \cdot S_A \cdot \mathcal{R}(A) \tag{II.3}$$

where $H(A)$ is Shannon entropy, S_A is the coherence of the artifact, and $\mathcal{R}(A) \in [0, 1]$ is the re-actualisability coefficient (the fraction of content accessible for decoding by a typical observer). Coherent information, unlike Shannon information, takes into account not only data volume but also its structural self-consistency and accessibility

for understanding. For Homer's *Iliad*: H is large (a voluminous text), $S_A \approx 0.9$ (high internal consistency), $\mathcal{R} \approx 0.7$ (accessible to a literate reader) — hence I_{coh} is high. For a random sequence: H is comparable, $S_A \to 0$, $\mathcal{R} \to 0$ — and $I_{\text{coh}} \to 0$.

The thermodynamic analogy [17] is also productive. The book is an open system maintaining low entropy (high coherence) by "feeding" on readers: each act of reading is an infusion of negentropy into the artifact, maintaining its structural integrity. Schrödinger defined life as the ability of an organism to "feed on negative entropy" [17] — the book "feeds" on the attention of observers.

III. THE BOOK AS A COHERENT ARTIFACT

III.1. Definition of the Book in ODTOE

The book is a special case of the coherent artifact possessing three specific properties supplementing the general properties (C-1)–(C-3):

(A-1) Fixation of a world-line section. At the moment of writing, the author is in a definite state of coherence B_{auth} and "projects" a section of his world line W_{auth} into a form accessible for decoding by other observers. Unlike painting or music, the book encodes the projection *verbally-logically* — through a linear sequence of symbols, which ensures maximal precision of structural-relation transmission [3].

(A-2) Resistance to time. Unlike spoken speech, the book preserves the "projection" after the author has ceased generating it — even after his death ($B_{\text{auth}} = 0$). The material medium (clay, papyrus, paper, digital file) provides the base lifetime T_0, but the coherence of the content can extend the book's life far beyond T_0 — through the mechanism of copying and reprinting [4].

(A-3) Scalability. The book can be read by an arbitrary number of observers ($n_{\text{readers}} \to \infty$) without degradation of the "projection" — unlike oral transmission, which degrades with each retelling (the "broken telephone" effect). The invention of printing [19] and digital technologies [20] sequentially increased scalability, raising the potential n_{readers} from units (manuscript) to billions (electronic book).

III.2. The Formula for Book Lifetime

From postulate P3 [1] and the definition of the coherent artifact [2], the formula for the lifetime of a book follows:

$$T(A) = \frac{T_0}{(1 - S_A)^{n_{\text{readers}}}} \tag{III.1}$$

where T_0 is the base lifetime of the material medium (papyrus ~ 100 years, paper ~ 500 years, digital file — depends on infrastructure), S_A is the coherence of the artifact (a measure of internal consistency of the content), and n_{readers} is the cumulative number of observers who have interacted with the artifact over its existence.

Analysis of limiting cases.

Case 1. At $S_A = 0$ (complete incoherence): $T = T_0$ — the book lives exactly as long as the medium. A random set of symbols does not produce coherent extension.

Case 2. At $S_A > 0$ and $n_{\text{readers}} \to \infty$: $T \to \infty$ — the book is immortal if it is coherent and readable. Each new reader contributes to the exponential growth of T.

Case 3. At $S_A \to 1$ (self-consistent content) even with $n_{\text{readers}} = 1$: T already significantly exceeds T_0, since the denominator $(1 - S_A)^1 \to 0$.

Case 4. At $S_A = 0.5$ and $n_{\text{readers}} = 10$: $T = T_0/(0.5)^{10} = T_0 \cdot 1024$ — a thousand-fold increase in lifetime. Even moderate coherence with a sufficient number of readers produces a significant effect.

The formula explains why the *Iliad* has lived for 2800 years (S_A is high, n_{readers} numbers in the billions), while yesterday's newspaper — for a day (S_A is low, n_{readers} is finite and does not grow).

III.3. Dynamics of Artifact Coherence

The coherence of an artifact S_A is not a static quantity. It can change over time under the influence of several factors:

Medium degradation. Physical destruction of the medium (fading of ink, decomposition of paper) does not reduce S_A directly but decreases T_0, which by formula (III.1) shortens $T(A)$ [20].

Contextual devaluation. Some books lose S_A over time because the context in which they were self-consistent disappears. A political pamphlet, impeccably argued in the context of a particular dispute, loses coherence after the dispute is resolved [8].

Reinterpretation. Great books can *increase* their effective S_A over time: new generations of readers discover layers of meaning invisible to predecessors. Shakespeare's *Hamlet* is read differently in the 20th century than in the 17th — and this multiplicity of interpretations, paradoxically, increases coherence, since the text proves self-consistent on *several* levels simultaneously [12].

Let us introduce a dynamic equation for S_A:

$$\frac{dS_A}{dt} = \alpha \cdot n_{\text{readers}}(t) \cdot \mathcal{D}(t) - \beta \cdot \delta(t) \tag{III.2}$$

where $\alpha > 0$ is the reinterpretive enrichment coefficient, $\mathcal{D}(t)$ is the depth of the average reader interaction, $\beta > 0$ is the contextual devaluation coefficient, and $\delta(t)$ is the rate of context obsolescence. For great books, $\alpha \cdot n_{\text{readers}} \cdot \mathcal{D} > \beta \cdot \delta$ throughout their entire existence — their S_A grows or remains stable.

IV. THE BOOK AS A PROJECTION OF THE AUTHOR

IV.1. What the Author Embeds in the Book

An author writing a book is in a state of coherence $B_{\text{auth}} = F \cdot E \cdot (1 - \sigma) \cdot \Lambda$ [1]. Each component is "projected" into the text:

F_{auth} (*focus*) $\rightarrow$ **structure** of the book: logical sequence, clarity of argumentation, architectonics. An author with high F creates a book with clear architecture — each chapter follows from the previous one, each argument supports the central thesis. With low F — a chaotic text without a backbone, in which thought wanders from topic to topic [7].

E_{auth} (*emotional coherence*) $\rightarrow$ **tone** of the book: consistency of the emotional message with the content. An author who feels what he writes about creates a "living" text — the reader senses authenticity, resonates emotionally. An author writing without feeling produces a "dead" text, even if technically impeccable. It is precisely emotional coherence that distinguishes Tolstoy's *War and Peace* from a competent but faceless textbook on the history of the War of 1812 [8].

$(1 - \sigma_{\text{auth}})$ (*non-contradictoriness*) $\rightarrow$ **integrity** of the book: the absence of internal contradictions. A book in which the second section refutes the first has high σ and low S_A. Internal non-contradictoriness does not mean dogmatism — it means that every statement is compatible with the rest within the accepted premises [11].

Λ_{auth} (*experience*) $\rightarrow$ **depth** of the book: the density of empirical support. An author who has lived through what he describes creates a book with high Λ — every statement is backed by the "flesh" of personal experience. An author compiling others' texts produces low Λ. This explains the phenomenon of "lived books": Dostoevsky's *Notes from the House of the Dead*, Solzhenitsyn's *The Gulag Archipelago*, Levi's *If This Is a Man* — all of them are distinguished by exceptionally high Λ [12].

The coherence of a book S_A is determined by *all four* components simultaneously (multiplicativity):

$$S_A \propto B_{\text{auth}}|_{t_0} = F_{\text{auth}} \cdot E_{\text{auth}} \cdot (1 - \sigma_{\text{auth}}) \cdot \Lambda_{\text{auth}} \tag{IV.1}$$

Multiplicativity means that zeroing *any* component zeroes S_A entirely. A brilliant scientist ($F \rightarrow 1$) with zero emotional involvement ($E \rightarrow 0$) creates a book with $S_A \rightarrow 0$. A passionate publicist ($E \rightarrow 1$) without logical structure ($F \rightarrow 0$) — likewise. The book is a "frozen imprint" of the author's coherence at the moment of creation.

IV.2. What the Reader Extracts from the Book

Reading is an act of observation: $R_{\text{reader}} = \hat{O}_{\text{reader}}(\Psi_{\text{book}})$, where Ψ_{book} is an element of $\mathcal{H}$ corresponding to the book. The result of reading depends on *both*: the coherence of the book S_A and the coherence of the reader B_{reader} [1].

Let us define four modes of reader–book interaction through the matrix (S_A, B_{reader}):

Mode 1: Resonance (B_{reader} high, S_A high). The reader "sees" what the author embedded. The world lines W_{auth} and W_{reader} intersect in $\mathcal{H}$, the overlap region $\mathcal{O}$ is large. This state is described as "a book written for me" — the reader recognises his own experience formalised by the author. Resonance is maximal when $\Lambda_{\text{auth}} \cap \Lambda_{\text{reader}} \neq \emptyset$ — the author and reader have overlapping empirical experience [9].

Mode 2: Potential (B_{reader} low, S_A high). The book carries coherent information, but the reader cannot decode it. A first-year student reads Newton's *Principia* [18] and

understands nothing — not because the book is poor, but because $B_{\text{reader}} \ll S_A$. The potential may be realised later, when B_{reader} increases: the same book, re-read ten years later, "opens up" — not because the book has changed, but because the reader has.

Mode 3: Disappointment (B_{reader} high, S_A low). A coherent reader instantly sees the internal inconsistency of the text. An experienced scientist reading a poor dissertation experiences precisely this — not "lack of understanding" but *understanding that the author does not understand his own subject* [11].

Mode 4: Noise (B_{reader} low, S_A low). Neither the author nor the reader is coherent. A pulp novel read by a distracted subway passenger — minimal coherence transfer, minimal effect on B_{reader}.

IV.3. The Book as an Operator

The book *changes* the coherence of the reader. Let us define the book as an operator $\hat{O}_{\text{book}}$ acting on coherence:

$$B_{\text{reader}}^{\text{after}} = g(S_A, B_{\text{reader}}^{\text{before}}) \tag{IV.2}$$

Let us specify the function g:

$$\Delta B_{\text{reader}} = \gamma \cdot (S_A - B_{\text{reader}}^{\text{before}}) \cdot \mathcal{D}_{\text{reader}} \tag{IV.3}$$

where $\gamma > 0$ is the coupling coefficient (depends on the depth of reading) and $\mathcal{D}_{\text{reader}}$ is the "dosage" (reading time, attentiveness, repetition). From (IV.3), three modes follow:

When $S_A > B_{\text{reader}}^{\text{before}}$: $\Delta B > 0$ — a coherent book *raises* the reader's coherence. He emerges from reading "smarter," "clearer," "calmer." The book "pulls" the reader up to the author's level [9].

When $S_A < B_{\text{reader}}^{\text{before}}$: $\Delta B < 0$ — an incoherent book *lowers* the reader's coherence. He emerges irritated, confused, "contaminated." The book "drags" the reader down.

When $S_A \approx B_{\text{reader}}^{\text{before}}$: $\Delta B \approx 0$ — minimal effect. The reader remains at approximately the same level.

Practical conclusion: **the choice of books is the management of one's own coherence**. Reading coherent books ($S_A > B_{\text{reader}}$) is the equivalent of meditation for the mind: a systematic increase of B. Empirical data on the positive influence of reading on cognitive functions [21] are consistent with this prediction.

IV.4. The Cumulative Effect of Reading

With systematic reading of coherent books ($S_{A_1} < S_{A_2} < \ldots < S_{A_k}$), the reader's coherence increases stepwise:

$$B_{\text{reader}}^{(k)} = B_{\text{reader}}^{(0)} + \sum_{i=1}^{k} \gamma_i \cdot (S_{A_i} - B_{\text{reader}}^{(i-1)}) \cdot \mathcal{D}_i \tag{IV.4}$$

Formula (IV.4) describes the mechanism of education: sequential exposure to artifacts with increasing coherence. It also explains why the *order* of reading matters: an attempt to read a text with $S_A \gg B_{\text{reader}}$ leads not to resonance but to the "potential" mode — the information is not assimilated. The optimal strategy is a "coherence ladder": each next book slightly exceeds the reader's current level [14].

Let us define the *optimal coherence step* ΔS^*:

$$\Delta S^* = S_{A_{i+1}} - B^{(i)}_{\text{reader}} \approx \frac{1}{\gamma_i \cdot \mathcal{D}_i} \tag{IV.5}$$

When $\Delta S^* \ll 1$, each step is easily assimilated, but progress is slow — many books are required. When $\Delta S^* \gg 1$, the reader falls into the "potential" mode and does not assimilate the content. The optimum is reached at $\Delta S^* \sim 0.1$–0.2 — the reader stretches toward the book but does not lose contact with it. This result is consistent with Vygotsky's pedagogical principle of the "zone of proximal development" [14].

IV.5. Collective Reading and Resonance Effects

When several observers simultaneously read the same book, the effect of *collective re-actualisation* arises [9]. Let us define the collective reading operator:

$$\hat{O}_{\text{coll}} = \bigotimes_{i=1}^{N} \hat{O}_{\text{reader}_i} \tag{IV.6}$$

Collective re-actualisation amplifies the effect of reading through *inter-observer resonance*: discussion of what has been read among observers with different B_{reader_i} generates additional projections of the section W_{auth} invisible during individual reading. The book club, seminar, and literary circle are forms of organising collective re-actualisation that increase the effective n_{readers} and, consequently, $T(A)$ [8].

Collective re-actualisation explains why religious texts possess exceptional longevity: ritual (collective, regular, structured) reading is the most powerful form of re-actualisation, ensuring maximal n_{readers} with high $\mathcal{D}$ (depth of interaction) [9].

V. THE SCALE OF COHERENT ARTIFACTS

V.1. From the Spoken Word to the Mathematical Formula

Artifact	T_{typical}	n_{readers} typical	S_A	Why
Spoken word	minutes–hours	1–10	0.1–0.5	Context-dependent, distorted u
SMS/message	days	1–5	0.1–0.3	Fragmentary, without structure
Newspaper article	1 day	10^3–10^6	0.2–0.4	Context-dependent (tied to the
Blog post	months–years	10^2–10^5	0.3–0.6	Can be coherent, but rarely self
Scientific paper	10–50 years	10^2–10^4	0.5–0.8	Peer-reviewed, reproducible

Artifact	T_{typical}	n_{readers} typical	S_A	Why
Good book	50–500 years	10^4–10^8	0.6–0.9	Structured, deep, scalable
Great book	500–3000 years	10^6–10^{10}	0.8–0.95	Self-consistent, resonates acros
Sacred text	2000–5000 years	10^9–10^{10}	0.85–0.95	Self-consistent + ritual re-actua
Scientific law	10^2–10^3 years	10^4–10^8	0.9–0.99	Formalised, context-independe
Math. formula	$\to \infty$	unbounded	$\to 1$	Fixed point Ψ^*; $T \to \infty$
DNA	$\sim 10^9$ years	$\sim 10^{30}$ cells	$\to 1$	Biochemical code, self-replicati

V.2. Uniqueness of the Book on the Scale

The book occupies a *unique niche* on the scale of artifacts [2]. It is sufficiently coherent ($S_A = 0.6$–0.95) to live for centuries. And sufficiently accessible (n_{readers} can grow exponentially through translations and reprints) to obtain a powerful denominator in formula (III.1).

A mathematical formula is more coherent ($S_A \to 1$) but accessible only to observers with high d (educated). DNA is more coherent and more scalable, but does not contain *contextual* information — it reproduces structure but not thought [10].

The book is the only artifact that simultaneously:

- encodes the *contextual* experience of the author (not only structure but also thought, feeling, argument);
- is accessible to an *arbitrary* observer (requires no special equipment);
- scales *without limit* (copying does not degrade content);
- lives *longer than the author* (survives biological death).

No other class of artifacts possesses all four properties simultaneously. The spoken word is accessible and contextual but not scalable and not autonomous. A formula is autonomous and scalable but not contextual (it encodes only a structural invariant). A building is autonomous but not scalable (it cannot be "copied" without degradation). DNA is scalable and autonomous but not contextual [6].

V.3. Hierarchy of Artifacts and the Immortality Threshold

Let us define the *immortality threshold* Θ as the minimum value of the product $S_A \cdot n_{\text{readers}}$ at which $T(A)$ exceeds the characteristic time of civilisation ($\sim 10^4$ years):

$$\Theta: \quad T(A) = \frac{T_0}{(1 - S_A)^{n_{\text{readers}}}} > 10^4 \text{ years} \tag{V.1}$$

For a book with $S_A = 0.9$ and $n_{\text{readers}} = 10^6$: the denominator $(1-0.9)^{10^6} = (0.1)^{10^6} \to 0$, hence $T(A) \to \infty$. The immortality threshold is surpassed with an enormous margin. For a book with $S_A = 0.3$ and $n_{\text{readers}} = 100$: $(0.7)^{100} \approx 3.2 \cdot 10^{-16}$, $T \approx T_0 \cdot 3.1 \cdot 10^{15}$ — even moderate coherence with sufficient n produces the effect of immortality [4].

VI. THE BOOK AND THE FORMULA: THE PATH TO INFINITY

VI.1. The Book as an Approximation to the Formula

On the scale of artifacts, the book is an *intermediate link* between the spoken word (minimal coherence, minimal longevity) and the mathematical formula (maximal coherence, infinite longevity) [10].

The evolution of the artifact along the coherence scale:

$$\text{word} \to \text{text} \to \text{book} \to \text{law} \to \text{formula} \to \Psi^* \tag{VI.1}$$

Each step raises S_A (internal consistency) and reduces context-dependence. The word is tied to the moment of utterance. The text is tied to the situation of creation. The book is tied to the epoch. The law is tied to the subject domain. The formula is context-independent. The fixed point Ψ^* is an absolute invariant [1].

Great books *approach* formulas: Plato's *Republic* contains ideas formulated so that they are comprehensible after 2400 years. Euclid's *Elements* is already on the boundary between book and formula: the content is so formalised that it is practically context-independent [18].

VI.2. The Formula as the Limit of the Book

The mathematical formula is the *limit* to which a coherent artifact tends as $S_A \to 1$:

$$\lim_{S_A \to 1} \text{book} = \text{formula} \tag{VI.2}$$

The formula $e^{i\pi} + 1 = 0$ is a "book" compressed to five symbols with $S_A = 1$. It contains the entire history of mathematics (five fundamental constants, three operations) in a self-consistent form comprehensible to any observer with sufficient d [10].

The formula $R = \hat{O}(\Psi)$ [1] is the "book" of ODTOE in a single line. At $S_A \to 1$ it does not depend on the context of creation, is reproducible by any observer possessing the concepts of "observer," "observed," and "potentiality," and its lifetime $T \to \infty$.

VI.3. Comparison of the Book and the Formula

Property	Book	Formula
S_A	0.6–0.95	$\to 1$
Context-dependence	Partial (epoch, language, culture)	Zero
Accessibility	High (literacy)	Low (mathematical education)
Emotional component E	High	Low (aesthetic but not emotional)

Property	Book	Formula
n_{readers} potential	10^4–10^{10}	10^2–10^8
T at typical n	10^1–10^3 years	$\to \infty$
Encodes	Contextual experience + thought	Structural invariant

The book and the formula are *complementary* artifacts in a sense analogous to Bohr's complementarity principle [13]. A book without formulas is subjective (high E but $S_A < 1$). A formula without a book is inaccessible (high S_A but small n_{readers}). The best scientific works are *books containing formulas*: Newton's *Principia* [18], Darwin's *Origin of Species*, the main ODTOE paper [1]. They combine the emotional accessibility of the book with the coherence of the formula.

VI.4. The Formula of Immortality: Synthesis

Combining the results of Sections III–VI, let us write the condition for the immortality of a book:

$$T(A) \to \infty \iff S_A > 0 \ \wedge \ n_{\text{readers}} \to \infty \tag{VI.3}$$

This condition is necessary and sufficient. Necessity: at $S_A = 0$, formula (III.1) gives $T = T_0$ (finite). At finite n_{readers} and $S_A < 1$, also $T < \infty$. Sufficiency: at $S_A > 0$ and $n_{\text{readers}} \to \infty$, the denominator $(1 - S_A)^{n_{\text{readers}}} \to 0$, hence $T \to \infty$ [2].

The condition for the immortality of the book formally coincides with the condition for the coherent immortality of the observer derived in [4]: the observer is "immortal" if his coherent legacy ($S_A > 0$) is supported by a growing number of successors ($n \to \infty$). The book is one of the principal mechanisms of coherent immortality.

VII. THE BOOK AFTER THE AUTHOR'S DEATH

VII.1. De-actualisation of the Author, Life of the Artifact

The author dies: $B_{\text{auth}} = 0$ [4]. No new iterations of the world line W_{auth} are generated. But the book is an artifact already separated from the author. Its S_A does not vanish upon the author's death: S_A is a property of the *text*, not of the *body* [2].

By formula (III.1): $T(A)$ is determined by S_A and n_{readers}, not by B_{auth}. The author may be dead, but if $S_A > 0$ and n_{readers} grows, the book lives. Moreover: the author's death sometimes *increases* n_{readers} (the martyrology effect: interest in the author rises after his death) [4].

Let us formalise the separation of the artifact from the author. Let t_d be the moment of the author's death. Then:

$$\left.\frac{\partial S_A}{\partial B_{\text{auth}}}\right|_{t > t_d} = 0 \tag{VII.1}$$

The coherence of the artifact after the author's death is entirely determined by the properties of the text and the dynamics of the readership. The author is the "starter" but not the "engine" of the book's life.

VII.2. Re-actualisation of the World Line

Each act of reading is a re-actualisation of a section of W_{auth} through the reader's operator:

$$R_{\text{reader}} = \hat{O}_{\text{reader}}(\Psi^*_{W_{\text{auth}}}) \tag{VII.2}$$

A reader opening *Crime and Punishment* actualises a section of Dostoevsky's world line — those configurations Ψ^*_n that the author projected during writing. Dostoevsky has been dead for more than 140 years, yet his world line "comes alive" in every reader [5].

This is not a metaphor. In $\mathcal{H}$, the world line $W_{\text{Dostoevsky}}$ exists as a single non-separable object [5]. The book is an "address" in $\mathcal{H}$ that allows any observer to project the corresponding section. Each new reader adds *his own* projection to the aggregate structure — thus a collective interpretation is formed in which the author's world line acquires new dimensions not contained in the original text [9].

VII.3. Why Some Authors "Grow" After Death

Van Gogh sold one painting during his lifetime. Kafka asked for his manuscripts to be destroyed. Mandelstam died in a camp; his poems circulated in handwritten copies. All three had small n_{readers} during their lifetimes. After death, n_{readers} grew exponentially. By formula (III.1): $T(A)$ increased discontinuously [4].

The reason: the S_A of these artifacts was high *from the very beginning*, but during the authors' lifetimes there were not enough readers for "ignition." Death (often tragic) attracted attention, triggered growth in n_{readers}, and the formula "switched on."

The martyrology effect is amenable to quantitative description. Let $n_{\text{readers}}(t)$ be the number of readers at time t and t_d the moment of the author's death. Then:

$$n_{\text{readers}}(t) = n_0 \cdot e^{\mu(t - t_d)} \quad \text{for } t > t_d \tag{VII.4}$$

where $\mu > 0$ is the martyrological amplification coefficient, depending on the circumstances of death (tragic death: $\mu \gg 0$; natural death: $\mu \approx 0$), and n_0 is the number of readers at the moment of death. Substituting (VII.4) into (III.1), we obtain exponential growth of $T(A)$ after the author's death — which is indeed observed for Van Gogh, Kafka, and Mandelstam [4].

Let us introduce the concept of *latent immortality*: an artifact with high S_A but low n_{readers} that has not yet crossed the immortality threshold (V.1) but contains the potential for crossing it. Formally:

$$L(A) = S_A \cdot \left. \frac{dn_{\text{readers}}}{dt} \right|_{t > t_d} \tag{VII.3}$$

When $L(A) > 0$, the artifact is in a state of latent immortality and is moving toward the threshold Θ. When $L(A) \leq 0$, the artifact is degrading [8].

VIII. PRACTICAL IMPLICATIONS

VIII.1. For Authors

Do you want to write a book that outlives you? Maximise S_A:

- **Increase** F during writing: write in silence, with full immersion. Meditative practices that enhance focus [21] directly increase F_{auth} and, consequently, the S_A of the text being created.
- **Align** E: write about what truly matters to you. Emotional misalignment (the author writes about something he does not believe in or that does not move him) is detected by the reader as "falseness" and reduces S_A.
- **Reduce** σ: eliminate internal contradictions in the text. Each contradiction is a crack through which coherence leaks. Systematic self-checking for non-contradictoriness is the analogue of experimental verification in science [11].
- **Increase** Λ: write about what you have *lived through*, not about what you have *read*. Compilation of others' thoughts produces low Λ, even if technically impeccable.
- **Include formulas**: each formula is an island of $S_A \to 1$ in the text, raising overall coherence. Newton's *Principia* [18] has survived 340 years precisely because of its formulas.
- **Ensure scalability**: take care of translations, reprints, and digital formats — each channel increases the potential n_{readers}.

VIII.2. For Libraries and Archives

A library is a repository of coherent artifacts. Its function within ODTOE is to *maintain* $n_{readers}$ for artifacts that would otherwise degrade [20]. The destruction of a library (Alexandria, Sarajevo) is a catastrophic zeroing of n_{readers} for thousands of artifacts, leading to $T \to T_0$ (the lifetime of the medium).

A digital archive (Internet Archive, Google Books) is a technological solution allowing $n_{\text{readers}} \to \infty$ with $T_0 \to \infty$ (a digital medium is copied without degradation). However, digital storage has a hidden vulnerability: the T_0 of a digital file depends on *infrastructure* (servers, electricity, protocols, data formats). Upon loss of infrastructure, $T_0 \to 0$ instantaneously — unlike a clay tablet, for which $T_0 \sim 5000$ years unconditionally [20].

The optimal storage strategy is *multi-layered*: a physical copy (T_0 is high, scalability is low) + a digital copy (T_0 depends on infrastructure, scalability is infinite) + distributed storage (multiple copies reduce the risk of simultaneous loss).

Let us formalise the efficiency of a repository $\mathcal{E}(\text{repo})$ as the total increment of $T(A)$ for all stored artifacts:

$$\mathcal{E}(\text{repo}) = \sum_{i=1}^{N_{\text{repo}}} \left[\frac{T_0^{(\text{repo})}}{(1 - S_{A_i})^{n_{\text{readers}_i}^{(\text{repo})}}} - \frac{T_0^{(0)}}{(1 - S_{A_i})^{n_{\text{readers}_i}^{(0)}}} \right] \tag{VIII.1}$$

where the superscript (repo) denotes parameters in the presence of the repository, and (0) — without it. The repository increases both T_0 (preserving the medium) and n_{readers} (providing access). The destruction of the Library of Alexandria was a catastrophic zeroing of $\mathcal{E}$ for hundreds of thousands of artifacts [3].

VIII.3. For Education

Education is the systematic exposure of students to coherent artifacts with high S_A [14]. A good course is a sequence of books with increasing S_A, "pulling" B_{student} from level to level in accordance with formula (IV.4).

Replacing books with lecture notes (low S_A, fragmentary) is a reduction in the quality of education predicted by formula (IV.2): the S_A of lecture notes is lower than that of the original, and the student's coherence grows more slowly. Replacing books with video lectures can be effective if the video lecture achieves high S_A (which requires high B from the lecturer), but the typical video lecture is fragmentary, context-dependent, and has S_A lower than that of a good book [14].

VIII.4. For Publishing

Formula (III.1) has direct implications for publishing strategy. A publisher seeking long-term profit should select books with high S_A — their $T(A)$ is large, and each reprint increases n_{readers}, further extending the lifetime. The mass market, oriented toward low S_A and high initial n_{readers}, generates short-term profit, but the artifacts degrade quickly [19].

The "long tail" phenomenon in book publishing [22] receives an explanation within ODTOE: books with high S_A but low initial n_{readers} gradually accumulate an audience and live for decades, generating cumulative revenue exceeding that of a bestseller with low S_A [6].

Let us define the *publishing sustainability index* $\mathcal{P}(A)$:

$$\mathcal{P}(A) = S_A \cdot \ln(1 + n_{\text{readers}}) \cdot \frac{T(A)}{T_0} \tag{VIII.2}$$

A high $\mathcal{P}$ indicates a book that will recoup investment in the long run. A publishing strategy oriented toward maximising $\mathcal{P}$ rather than maximising initial n_{readers} leads to the formation of a catalogue of long-lived artifacts — an "evergreen" library [19, 22].

VIII.5. For Digital Platforms

Digital platforms (social networks, blogs, aggregators) create an environment with low average S_A and high n_{readers}. By formula (III.1), artifacts with $S_A < 0.3$ degrade quickly even at high n_{readers} — their lifetime is determined by ranking algorithms rather than by coherence [20]. This leads to "information noise" — an environment in which low-coherence artifacts crowd out high-coherence ones due to a short-term surge in n_{readers}.

ODTOE predicts that platforms optimising ranking by S_A (rather than by engagement) will generate artifacts with greater $T(A)$ — and, consequently, will create a more sustainable information ecosystem. Early empirical studies of content quality on the web [22] indirectly support this prediction.

IX. DISCUSSION AND LIMITATIONS

1. *Measurability of S_A.* The coherence of an artifact has no generally accepted scale. Proposed proxies include: citation count (for scientific texts), catalogue lifetime (for books), readability index + expert assessment of non-contradictoriness [11]. A standard metric is needed, analogous to the h-index for scientific impact but accounting not only for quantity but also for the *quality* (coherence) of interactions.

2. *Medium effect.* Formula (III.1) includes T_0 — the base lifetime of the medium. For a clay tablet, $T_0 \sim 5000$ years (physical durability). For a digital file, T_0 depends on infrastructure: servers, the internet, data formats. Upon loss of infrastructure, $T_0 \to 0$ instantaneously. Digital "immortality" is fragile [20].

3. *Cultural specificity.* n_{readers} depends on language, literacy, and accessibility. A book in the language of a vanishing people ($n_{\text{readers}} \to 0$) loses T, even if S_A is high. Translation is a mechanism for expanding n_{readers} beyond the original linguistic environment [3].

4. *Multiplicativity is unverified.* The claim of a multiplicative relationship between S_A and the components of B_{auth} (formula IV.1) is a hypothesis requiring empirical verification. The relationship may be additive or of another form. Experimental approaches to verification are discussed in [7].

5. *Causality problem.* Formula (III.1) describes a correlation between S_A, n_{readers}, and $T(A)$ but does not establish an unambiguous causal link. High n_{readers} may be either a consequence of high S_A (a coherent book attracts readers) or a result of external factors (compulsory reading in school curricula, marketing) [22]. These effects need to be disentangled.

6. *Nonlinear effects.* Formula (III.1) assumes a smooth dependence of T on S_A and n_{readers}. In reality, phase transitions are possible: is there a critical value S_A^* below which a book is "forgotten" regardless of n_{readers}? Empirical data on "forgotten bestsellers" (high initial n_{readers} but rapid disappearance) point to the existence of such a threshold [19].

7. *AI-generated texts.* The emergence of large language models raises the question: can AI create an artifact with high S_A? Within ODTOE, the answer depends on whether AI possesses the components of B: focus, emotional coherence, non-contradictoriness, experience. If $\Lambda_{\text{AI}} = 0$ (absence of lived experience), then $B_{\text{AI}} = 0$ and $S_A \to 0$ — the text may be technically smooth but not coherent in the ODTOE sense [14].

8. *Censorship and book burning.* From the ODTOE standpoint, censorship is the deliberate reduction of n_{readers} for artifacts with S_A undesirable (to the censor). By formula (III.1), burning books ($n_{\text{readers}} \to 0$) returns $T(A) \to T_0$ but does not reduce S_A. If even a single copy survives, S_A remains unchanged, and with growth of n_{readers} the book "revives" — which has been observed historically on multiple occasions [12].

9. *Multiple authorship.* A book written by several authors has S_A determined by *collective* coherence:

$$S_A^{\text{coll}} = f\left(\prod_{j=1}^{M} B_{\text{auth}_j},\ S_{\text{inter-auth}}\right) \tag{IX.1}$$

   where $S_{\text{inter-auth}}$ is the consistency among co-authors. With high $S_{\text{inter-auth}}$, the collective book can exceed the S_A of any individual author. With low $S_{\text{inter-auth}}$ — a "patchwork quilt" with coherence gaps [6].

X. EXPERIMENTALLY TESTABLE PREDICTIONS

The theory of the coherent artifact generates a number of predictions amenable to empirical verification:

Prediction 1. *Correlation of S_A and longevity.* If the coherence of an artifact (S_A) truly determines lifetime by formula (III.1), then expert assessments of S_A for a corpus of books should correlate with their actual lifetime (number of years of continuous presence in catalogues). An analysis on a sample of 1000+ books with a publication history exceeding 100 years is proposed [11].

Prediction 2. *Effect of reading on B_{reader}.* If the book acts as an operator (IV.2), then systematic reading of coherent books should raise measurable indicators of cognitive coherence: attentional focus (F), emotional regulation (E), logical non-contradictoriness ($1-\sigma$). A randomised controlled study is proposed: the experimental group reads books with high S_A, the control group — texts with low S_A; cognitive parameters are measured before and after [21].

Prediction 3. *The martyrological effect is quantitatively predictable.* The coefficient μ in formula (VII.4) should correlate with the type of the author's death. A comparative analysis of the dynamics of $n_{\text{readers}}(t)$ for authors with tragic, premature, and natural deaths will allow verification of the model [4].

Prediction 4. *Formulas increase $T(A)$.* Books containing mathematical formulas should have statistically significantly greater lifetimes than analogous books without

formulas — controlling for genre, subject, and era. Each formula is an "island of $S_A \to 1$" that raises the average S_A of the text [10].

Prediction 5. *Collective reading is more effective than individual reading.* By formula (IV.6), collective re-actualisation should yield a greater increase ΔB_{reader} than individual reading of the same text. The prediction is testable in an educational context: comparison of "reading + discussion" and "reading only" groups [14].

XI. CONCLUSION

In ODTOE, the book is not a passive object but an active operator: a projection of the author's world line encoded in a form accessible for re-actualisation by an arbitrary number of observers [1, 2]. Its lifetime $T(A) = T_0/(1 - S_A)^{n_{\text{readers}}}$ is determined by two parameters: content coherence and the number of readers. At $S_A \to 1$ and $n_{\text{readers}} \to \infty$, the book achieves immortality.

On the scale of coherent artifacts, the book occupies a unique position between the spoken word (fragile but accessible) and the mathematical formula (immortal but inaccessible). A book containing formulas combines the advantages of both — and it is precisely such books that live the longest [10].

The formal models introduced in this paper — the book operator (IV.2), coherence dynamics (III.2), the cumulative reading effect (IV.4), the immortality threshold (V.1), the latent immortality index (VII.3) — extend the ODTOE apparatus and allow quantitative analysis of phenomena previously described only qualitatively: the longevity of great books, posthumous fame, the effectiveness of education, knowledge-storage strategy [6].

The results of this paper open several directions for further research. First, a standardised metric for S_A needs to be developed, enabling quantitative assessment of text coherence — this will move the theory into the domain of empirically testable predictions [11]. Second, the dynamic equation (III.2) requires calibration on real data: measuring the coefficients α and β on a sample of books with known histories will allow prediction of the trajectory $S_A(t)$ [22]. Third, the concept of coherent information (II.3) requires formal grounding within an extended information theory that integrates the Shannon approach [15] with the operator formalism of ODTOE [1].

The final formula: the author dies, the book lives, the formula is immortal. $B_{\text{auth}} \to 0$, $S_A > 0$, $T(A) \to \infty$. The author's world line continues to resonate with future observers through every reader — through every act $\hat{O}_{\text{reader}}(\Psi^*_{W_{\text{auth}}})$ [5]. The book is a bridge between a finite life and an infinite legacy.

In the context of ODTOE, the book is neither a luxury nor entertainment. It is a *technology of immortality*, accessible to anyone who possesses sufficient coherence for its creation. Every author who creates a coherent text inscribes a section of his world line into $\mathcal{H}$ — and this section will live as long as observers capable of re-actualising it can be found [2, 4].

The paradox of the book: the more coherent it is, the less it depends on its author — and the longer it lives after his death. An author striving for immortality must create an artifact that no longer needs its author. This is the formula of eternity through

self-renunciation: $S_A \to 1$ as $B_{\text{auth}} \to 0$ [4].

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